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Railway Age

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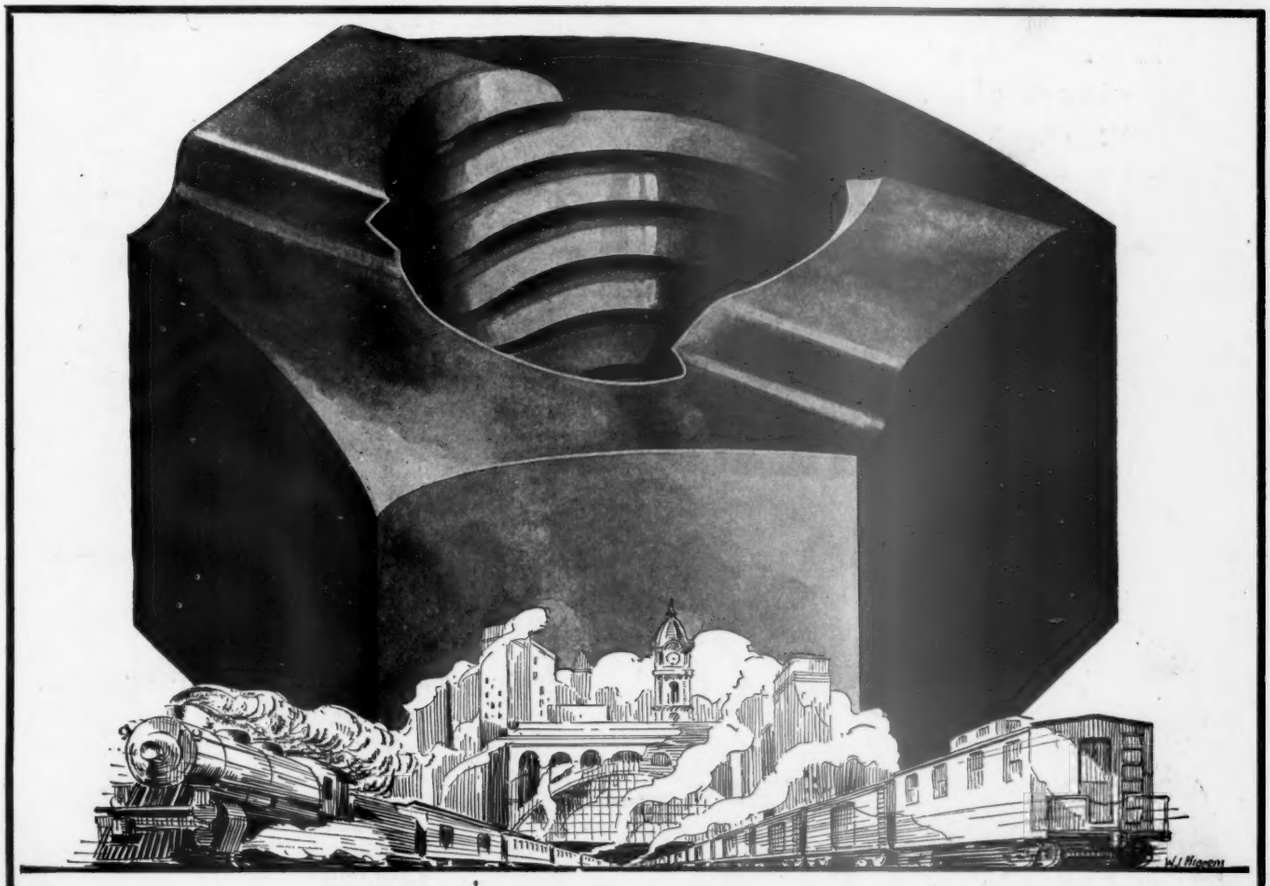

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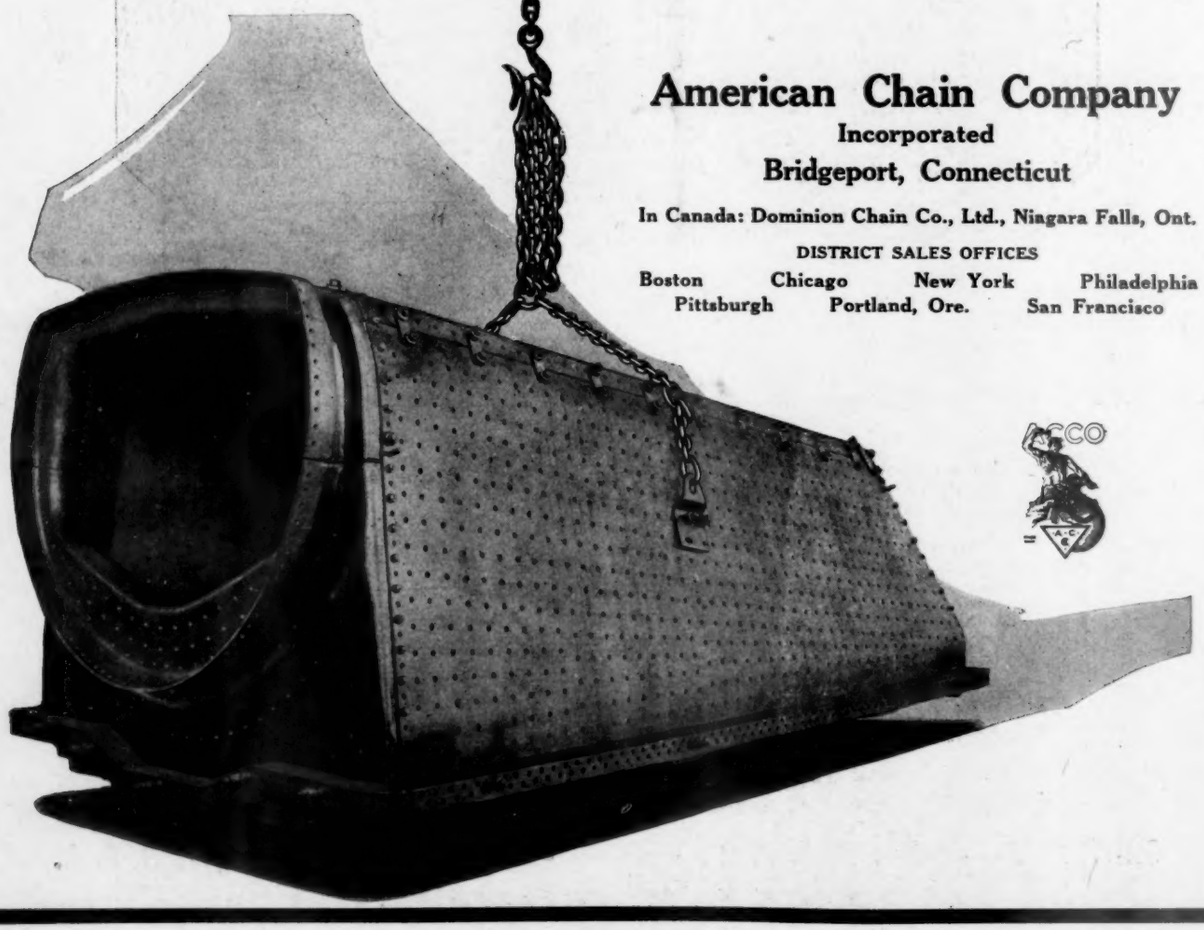

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EDITORIAL

Railway Age

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All railroads have today a special duty to make friends of their patrons. There are many ways in which this may be done, but above all things it must be remembered that actions speak louder than words. Basing its remarks on a news item, to the effect that the Long Island Railroad has killed no passenger in a train accident in three years, the New York Herald prints a 300-word editorial congratulating the officers and employees on their skill and fidelity throughout these 36 months. Moreover, C. D. Baker, general superintendent of the road, does his part to make the editorial effective by reprinting it in full, with a message to employees, commending the conscientious effort and hearty co-operation which have made this good record. In the last analysis it must be admitted that it is a great thing to conduct an enormous passenger traffic with the highest degree of safety, even if occasionally a brakeman does forget his manners, or a baggageman delays your trunk. And the Herald's editorial is to be commended for its intelligence and sanity. The number of passengers carried by the Long Island Railroad in the three years was 212,317,406.

A Railroad Appreciated by the Public

The Railway Accounting Officers' Association will hold its annual meeting this year at Cleveland, June 6 to 9. The meeting will be the same busy affair that the Accounting Officers' conventions usually are. The agenda this year is a document of over 350 pages. For the first time in the history of the organization, one committee has covered subjects numbering over the 100 mark, the committee on freight accounts having reported on 103. At its 1921 meeting the R. A. O. A. took the important step of making mandatory a sizable portion of its interline accounting rules and it adopted an unusually large number of new accounting forms. The 1921 meeting was one of the best in the association's history. This year, among the leading factors of interest, are the recommendations relative to the standardization of station accounting forms and practices, a matter of special importance. The meeting will give considerable attention to the requirements of the Interstate Commerce Commission as to the reports it requires from the railways. It has had a large amount of correspondence with the bureau of statistics during the past year relative to a proposed change in the compilation of freight commodity statistics. The bureau has suggested that it might require the carriers to report, in addition to the tonnage of their various commodities carried, the number of car loads, the ton-miles and the freight revenue, which proposal the association has argued against on the basis of its cost and the feeling that the increased information might not be sufficiently valuable, or that it might lead to mistaken conclusions as to the figures of the different roads. Another interesting proposal that will be advanced this year is the scheme to modify the present classification of railway operating expenses. The committee on disbursement accounts has proposed a very considerable reduction in the primary accounts and the creation of a new general account under the name of "Casualties" which will include damage to property, freight loss and damage, injuries to persons, etc. This is an important step and one which will be watched with great interest by railway men in other departments as well as by those in the accounting department.

Accounting Officers' Meeting

Whether the summer season this year is to bring in large increases in passenger revenues or not is a matter of conjecture. The potential traffic during the vacation season is, of course, immense. How much of it will actually materialize, however, is another matter and one which is largely up to the railroads. Excursion and tourist rates are being offered in pleasing number by most roads, but in many cases these could be largely extended. Tourist and excursion rates have two results—one, increased business, and, the other, better feeling toward the railroads on the part of the public. One feature of American practice in running excursions is rather difficult to understand, i.e., excursions are run almost entirely on holidays and Sundays when business would normally be high even at regular rates. Then on week days traffic moves only in fractional volume. The extra cars and locomotives which are called into service on Sunday spend six days in idleness. American roads have never gone as far in stimulating travel by reduced rates as have the British railways. Conditions in the two countries vary greatly, of course, but the full utilization of existing passenger equipment could scarcely help being remunerative. An outline of the reduced rates offered by the British railways will be found in the Foreign Railway News column of this issue. This information should be of value to American railway officers who are studying situations where they may profitably apply excursion and tourist rates.

To Increase Passenger Business

If a division superintendent in charge of a fairly heavy traffic division on which trains are operated under the manual block system and on which each freight train is delayed an average of one hour because of the length of blocks, was told that this meant a loss of $87,600 a year for every ten freight trains receiving such a delay daily, he would be negligent indeed if he did not attempt to improve conditions. The records compiled on one road showed the cost of delays to freight trains to average 40 cents a minute. In order to overcome the defects of the manual block system with its long, irregular blocks, automatic signals were installed and the average freight train time over the division was reduced from 10 hr. 29 min. to 8 hr. 49 min. The saving in this case, on the basis of 40 cents a minute, amounted to $40 a train or $400 a day for ten trains, the equivalent of $146,000 a year. Under these conditions it is easy to see that such installations would pay for themselves quickly. Unfortunately, the division superintendent has so many and such varied duties to perform that he cannot devote the time he should to such studies. However, those who have had opportunity to do so have found that a proper signal installation will yield a

Cost of Delays to Trains

high return on the original investment and are sold to the idea because the improved operating results redound to their credit. It would appear that every division superintendent would be well repaid for investigating the results which may be accomplished by such installations on his division, if automatic signals are not yet in service.

Faithful Are the Wounds of a Friend

Every railroad officer who is fully alive to his responsibilities and his privileges is today constantly on the lookout for opportunities to show his friendliness toward the public. Years of unfriendliness in the past must be obliterated (and without stopping to consider whether it is your road or some other road that is responsible for failures to give the public satisfactory service). And, what is equally important, every citizen who *thinks* that the railroads have not been fair to him must be placated. But in the midst of these efforts to please the prospective patron there may be a stern duty to do things that will displease him—but which are for his good. A correspondent in Tennessee calls our attention to the fact that the law of that State requiring automobiles to be stopped at railroad crossings contains a section (Sec. 3) preserving the right of people struck at crossings to sue the railroad for damages. An auto driver may deliberately disobey the law requiring him to stop, and yet in the following week go before a dozen sympathetic jurymen, if he has been hit by a train, and do his best to wheedle them into deciding that the railroad was to blame for his injury. Every railroad lawyer in Tennessee is in duty bound to advocate the repeal of that Section 3; but, as we have suggested, that simple plea for justice would be interpreted by many persons as an unfriendly act; a move of the wicked railroad to fatten its treasury. "Faithful are the wounds of a friend;" but the railroad officer who inflicts that kind of wound and who expects the public still to class him as friend, has a big task on his hands. One optimistic railroad officer, commenting on the New York and Pennsylvania rules requiring common-carrier automobiles to stop at crossings, classes these rules as laws "with teeth in them." But he will have to admit that whoever causes these teeth to bite, whether state officer or railroad policeman, will have difficulty in maintaining his reputation as a true friend of the public. Actually to make drivers stop at crossings would require an elaborate campaign.

The Subsidized Agencies of Transport

Motor truckmen and ship owners charge certain sums for conveying goods and passengers. Highways and waterways are provided and maintained by taxing the public. The cost to society of highway and water transport, then, is not only the sum paid to these agencies in freight and passenger charges but is that sum plus the cost to society of the highways and waterways. In many cases, then, where ships and motor trucks are taking business away from the railroads, they are doing so not because their form of transport is more economical, but because the public is subsidizing them out of the public treasury. A few shippers secure the benefit of lower rates but the people as a whole by allowing themselves to be taxed for highways and waterways are making possible the operation of uneconomic systems of transportation. These are the general conclusions brought out at a meeting of the British Institute of Transport, which is reported in an article on another page of this issue by Samuel O. Dunn, editor of the *Railway Age*. Champions of the motor and ship-owning interests attacked these conclusions but, according to Mr. Dunn, they were unable to meet squarely the criticism that they must justify themselves on a basis of total cost to the public, and not upon the rates they charge without taking into account the use of a right-of-way which they have practically free of cost to themselves. The competition of motor trucks and buses and steamers on the inland waterways is not so serious a matter for the railways of this country as it is for those of Great Britain, but it is serious enough even in this country and one upon which the public is not well informed. The meeting of the Institute of Transport brought out many arguments on both sides of the case and the article we publish can be read with profit by all railway officers who desire to meet the arguments of the propagandists for the subsidized forms of transport—the motor truck and the steamboat.

The Ultimate Cost of Poor Tools

One of the principal reasons why many railroads still buy shop tools and equipment on a price basis is because mechanical department officers fail to convince those higher up that poor tools waste annually, and sometimes monthly, many times their first cost. Standardized small tools, such as twist drills and reamers, may be taken as an example. Because of keen competition, drill manufacturers must be thoroughly familiar with their competitors' drills. They know which of the companies are producing good drills and which are cutting the corners here and there, producing less efficient drills at a lower price. The average hole-producing capacity of the various makes of drills and reamers are known to the individual manufacturers, and when the latter observe that the railroads place orders time after time, not with the standard drill manufacturers, but with some little company which cuts the corners and then cuts the price, their opinion on railroad buying can better be imagined than expressed. One drill manufacturer, in explaining the situation and pointing out the false economy of buying shop tools solely on a price basis expresses himself very fairly as follows: "You can scarcely blame the railroads, handicapped as they have been by the lack of actual cash, if they should have adopted this policy (price buying) for a few months or a year, but now it has been going on for a little over a year and there seems to be no let up in it. Not only in our line but in many lines the railroads are actually losing money by this short-sighted policy." The cost of unit producing, rather than the cost of unit purchase, is what counts in buying railway shop machinery and tools. Every effort should be made to impress this fact as strongly as possible on railroad executives and department heads responsible for the actual placing of orders. It is obviously poor business to save five per cent on the cost of a drill or other tool and send it to the shop where it breaks on the first trial, produces no useful work, and has to be sold for scrap. Twist drills are typical of many other standard and special shop tools in which quality is the first consideration, the ultimate cost of the tools being a function of work done rather than first cost.

Big Questions for Small Station Agents

Some of the movements for the improvement of the railroad service seem to be all right except in the one particular that they do not go far enough. A new station building sometimes comforts the superintendent in such an extremely satisfactory way that he temporarily forgets the fifty shabby stations that are on his mind night and day—or ought to be. He has done well, but he has not gone very far. The letter of the Local Freight Agent printed in this issue reminds us of this aspect of railroad progress. He does not know how to apologize for a slow claim department and a severely strict treasury department. He gets no satisfaction when we tell him that freight claims are being settled much more promptly

than they were four years ago. His problem is to answer the dissatisfied patron *now*, concerning *present* practice. Should not the improvement of this feature of the service be pushed ten times harder than it has yet been pushed? And the refusal to give credit on freight bills—would not a local banker give much more detailed and thorough attention to this point than you are giving to it, Mr. Railroad Treasurer? If you must be strict with farmers because your country station agent is a small-size business man, or is inexperienced, is it not a duty to explain that point much more carefully than is usually done? Getting into touch with the public in a really sympathetic way involves a heap of work, every day!

Reduction of the "Fair Return"

VERY MUCH the most unsatisfactory feature of the Interstate Commerce Commission's decision in the recent general rate case is the part of it relative to the percentage of net return the railways will be allowed to earn.

The opinion specifically holds that the record does not show any general inefficiency in management. It states that continuance of the commission's investigation of the value of the railways has tended to confirm the tentative violation made by it in the rate decision in 1920. These findings should help to create a healthy public opinion regarding railway matters and to stabilize railway securities.

The finding reducing the average rate of return allowed to be earned from 6 per cent to 5¾ has an exactly opposite tendency. On the basis of the valuation made in 1920 it reduces by $47,250,000 the amount of net return that may be earned annually. This is 6 per cent on eight hundred million dollars. It is, therefore, equivalent to a reduction of eight hundred million dollars in the amount of new capital which the railways can raise.

The commission evidently believed that the railways, if allowed 5¾ per cent, could raise enough new capital. Past experience and present conditions seem to demonstrate that this belief is unfounded. The experience of the last fifteen years has indicated that under normal conditions the railways need to earn approximately 5¾ per cent on their *property investment* in order to raise enough new capital. Their valuation is less than their property investment and therefore experience indicates that they need to earn more than this percentage on their valuation. Furthermore, this experience antedates the "recapture" provisions of the Transportation Act. Under these provisions all railways which in any year earn more than 6 per cent must pay over one-half of the surplus to the government. Thus 5¾ per cent on the valuation probably would not yield the railways as a whole more than 5¼ per cent on their valuation. This as an average, year by year, would certainly have been too low under the financial conditions before the war.

The present general financial conditions are no more favorable. At the present time only very good railway bonds are selling in the open market on a five per cent basis. A higher rate would have to be paid on additional and poorer secured bonds. The best railway stocks are selling on a basis that yield six to seven per cent. Railways with only average credit would have to pay higher rates than these to issue new securities, while railways with poor credit would have to pay very much more, if, indeed, they could finance them at all. The prices of the securities of railways which already are earning approximately the return which the commission holds should be earned as an average seem to make clear that if the railways as a whole did earn this average they could not under present conditions raise the new capital needed adequately to develop their facilities.

The situation would be improved if railway managers and investors could feel any assurance that even the 5¾ per cent return would be allowed to be earned as an average, over a period of years. The unfortunate, but incontrovertible fact, however, is that never since the Hepburn act went into effect sixteen years ago has the Interstate Commerce Commission "made good" on its own findings regarding what the railways should be allowed to earn. It so regulated the rates that the percentage of net return earned declined almost constantly during the ten years, 1906 to 1916. The commission in its opinion in the recent rate case frankly recognized the fact that the development of the railways has fallen far behind what it should have been. The commission's policy in regulating rates has contributed more toward arresting their development than all other causes combined. The older members of the commission probably will not admit this. It must be plain to the newer members.

The commission has made a mistake in reducing the "fair return." The law makes it its duty to allow the railways under efficient and economical management to earn enough net return to enable them to furnish sufficient railway transportation for the people of the United States. The railways cannot even hope to do this unless they are allowed to earn a net return averaging at least 5¾ per cent in both good years and bad years. That means, of course, that if they earn less than 5¾ per cent in bad years they must be allowed to earn equal additional amounts in good years. It is most doubtful if even then the railway facilities of the country could be adequately developed.

The railways should not accept this part of the commission's decision without the most vigorous protest. It would be easy under normal business conditions to correct a reduction of rates made to produce an *adequate* return if the reduction of rates proved too great. It would probably prove far more difficult to secure an advance in a rate of return held to be reasonable once it had been both established by the commission and tacitly accepted by the railways. A return of six per cent is the very minimum which the railways should be asked to accept. It is the least under which it is conceivable that they can raise enough new capital adequately to develop their facilities. Therefore, it is the least to which in the public interest the commission should have even considered restricting them.

Equipment Orders in May

THE DOMESTIC orders for freight cars reported in the four issues of the *Railway Age* in May totaled 18,427; for passenger cars, 235, and for locomotives, 99. Among the important freight car orders were included 3,000 for the Chesapeake & Ohio, 6,140 for the Southern, 2,300 for the Katy, 2,000 for the Santa Fe, etc. The passenger car orders included among others, 100 for the Southern, 63 for the Chesapeake & Ohio and 30 for the Katy. The leading locomotive purchases were 50 for the Chicago & North Western and 20 for the Atlantic Coast Line. The orders of freight cars, passenger cars and locomotives reported in May were, in each case, less than in April but greater than the figure for any previous month of 1922 except April.

The real news in the equipment figures, however, is contained in the five months' totals, and particularly the freight car totals. Since the beginning of the year the *Railway Age* has reported in its equipment and supplies column the placing of orders for a total of 77,053 freight cars, 1,195 passenger cars and 460 locomotives. The buying movement that is exemplified in the freight car figure is the interesting detail, for a comparison with previous years shows that in the case of freight cars we are now observing the largest buying movement of rolling stock for domestic service that we have had for a period of no less than 10 years. The five months' total for 1922—77,053 cars—compares with a figure for all 12 months of 1921 of but 23,346; of 1920, 84,207 (which the 1922

orders will soon exceed); of 1919, 22,062, and of 1917, 79,-367. In 1912, to go back to the beginning of the ten-year period, the domestic freight car purchases totaled 234,758. The best year since 1912 has been 1916, in which year 170,-054 cars were ordered. Orders for 1922 to date are considerably ahead of 1916, for in the first five months of 1916 the orders totaled 49,551, or 17,500 less than in the first five months of 1922.

DOMESTIC ORDERS

	Locomotives		Freight cars		Passenger cars	
	1922	1916	1922	1916	1922	1916
January	5	231	7,960	14,613	235	...
February	8	272	14,771	9,323	160	...
March	76	634	6,550	14,233	25	...
April	272	178	29,345	7,228	540	...
May	99	248	18,427	4,154	235	...
Total 5 months	460	1,563	77,053	49,551	1,195	736

The total passenger car orders for the first five months of 1922 has been 1,195, which compares with a figure for the first five months of 1916 of 736. In 1916, as a whole, the passenger car orders totaled 2,544, but this total ran about 500 behind the totals for 1913 and 1915. The locomotive orders have not been doing so well comparatively as the car orders. The 1922 first five months' figure of 460 compares with 1,315 for the first five months of 1916. The total domestic locomotive orders in 1916 were 2,910, that year being the best from 1913 to date.

The First of the Wage Reduction Decisions

IN THE FIRST of the series of decisions on the petitions of the roads for a reduction in the wages of certain classes of their employees, the Railroad Labor Board has authorized decreases of approximately 13 per cent in the rates for maintenance of way forces. Additional decisions affecting the shop crafts and clerical and other employees are expected within a few days. These reductions will all become effective on July 1.

It is estimated that the decision already announced will save the roads approximately $48,000,000 annually and with the reduction of nearly $150,000,000 in the maintenance of way payroll of a year ago, will reduce the expenditure for maintenance of way labor nearly $200,000,000 annually from the high point of 1920. The reduction which has just been made public follows closely after the decrease in freight rates announced by the Interstate Commerce Commission on May 24, also effective on July 1, which it is estimated will reduce the revenues of the roads by approximately $225,-000,000.

It is evident that the reductions in wages already announced and those yet to appear will go far in offsetting this loss in revenue.

This decision is in accordance with the general trend of wages. It follows the decline in the cost of living and also reduces the differential between the wages which the roads have had to pay and those for which they can secure their labor in the market. It is this differential which has given the impetus to the contracting of much work in recent months.

Coming as it does at the season when maintenance of way work is at its height, this reduction will do much to stimulate activity.

The board has acted wisely in reducing the wages of track foremen less than those of the laborers in their gangs and thereby increasing the spread between the pay of the two groups. It is in the interest of economy for the roads to pay their foremen a sufficient rate to make this position attractive to men of the proper caliber. There is a sentiment in some quarters that the roads should not take advantage of any reduction in the wages of their foremen, but should hold them where they are and thereby attract a better class of men as the wages in other industries and in other branches of railway service decline. In contrast with the action with reference to track foremen, the Labor Board has decreased the spread slightly between skilled mechanics and their foremen.

The reduction of a year ago removed the increase given unskilled labor in July, 1920, and the present reduction takes away 5 of the 12 cents granted the men in Supplement No. 8 to General Order No. 27 of the Railroad Administration, issued in September, 1918. Insofar as skilled labor and foremen are concerned, the new rates will be approximately the same as those established in July, 1920.

This decision again emphasizes the impracticability of fixing uniform wages which are equally applicable over a wide area, because of the wide variation in local conditions and the constant change in these conditions from day to day. In most localities, the roads can take advantage of the reductions authorized and still retain their forces because of the fact that the new rates will still be considerably above those prevailing in other industries. However, in the industrial centers where activity is becoming more marked there are already indications of a shortage of labor, even with the rates now paid, and predictions are now being made freely that the roads will not only not be able to take advantage of the reductions authorized in these centers, but may even be forced to raise their rates to secure the necessary men. In other words, as the wages of railway employees are gradually approaching those in other industries, it is evident that they must be fixed as they always have been fixed by the relation between the supply and demand in each locality if the roads are to secure the quality and numbers of men they require at reasonable rates.

New Books

Mechanical Appliances for Handling Railway Traffic, by George Bulkeley. 132 *pages, 5 in. by 7½ in., illustrated, bound in cloth. Published by the Railway Gazette, London, England.*

As the importance, and in many cases the absolute necessity, of material handling devices is being more clearly recognized every day, any book as suggestive as this will be of interest to many. While the author, who is connected with the Great Western Railway, has evidently had in mind primarily the needs of freight houses, transfer points, terminals and docks, many of the devices and methods shown are also of use at storehouses, shops, roundhouses and other places.

Of the 94 illustrations, the majority show different types of material handling machinery in actual service moving various materials under diverse conditions. In addition to these application photographs there are several diagrams showing principles involved; also methods and arrangements that have been found to be successful. Such commonly employed devices as wedges, jacks, chain and rope blocks, hand cranes, winches, ropes, hooks and derricks are treated first. Following this is a chapter on portable devices, including hand trucks, industrial power trucks, tractors, trailers, portable cranes, stackers and various types of portable conveyors. The next chapter treats of cranes, continuous conveyors and various combined appliances. Electric telphers and overhead carrier systems are described and shown in use. Chapters on highway cartage, dock working and the equipment for medium sized freight stations and storehouses complete the book.

Letters to the Editor

[*The* RAILWAY AGE *welcomes letters from its readers and especially those containing constructive suggestions for improvements in the railway field. Short letters—about* 250 *words—are particularly appreciated. The editors do not hold themselves responsible for facts or opinions expressed.*]

"Stop" versus "Danger" at Highway Crossings

BALTIMORE, Md.

TO THE EDITOR:

What is the meaning of the word "Danger?" The traveler on the highway encounters a variety of signs such as "DANGER —CURVE AHEAD," or "DANGER—SCHOOL—GO SLOW," or "DANGER—ONE WAY BRIDGE." The motorist becomes so accustomed to seeing these signs, that he seldom pays attention to them other than perhaps to slightly reduce the speed of his car. In fact, the observance of the word "danger" as applied to these warnings appears to mean merely driving at reduced speed.

A railroad crossing is always dangerous; but a crossing signal displaying the restrictive indication means but one thing—*train approaching, stop!* The motorist seeing the word "danger" displayed is likely to use his own judgment as to whether the situation is dangerous enough for him to stop his car. The word "stop," however, has but one meaning; it can leave no doubt in his mind. "Stop" is a command addressed to the motorist personally. The word "danger" is merely descriptive of conditions as they exist at that point. It is impersonal.

A signal indication, to be effective, should be as simple and readable as possible. The word "danger" contains so many letters that it must necessarily be printed in smaller type than would be needed for a shorter word. It therefore cannot be read as easily or from as great a distance as this simple word, containing only four letters, displayed in large type—STOP.

CHARLES ADLER, JR.,
Signal Engineer, Maryland & Pennsylvania R. R.

Educate the Public as to Motor Truck Competition

ILLMO, Mo.

TO THE EDITOR:

Motor truck transportation on highways built and maintained at public expense, has been discussed from various angles in the technical journals, the magazines, and in the dailies. Some classes of people even take the view that the motor truck has come to displace the railways and that the latter are about to lose the pre-eminent place that they have held in the transportation field.

Numerous problems remain to be solved in the transportation field. As regards railroad transportation, stockholders, officials and employees do not always agree as to the solution of the varied problems; this is particularly true of questions relative to working conditions and compensation. There is, however, every reason why all three parties should agree as to just what our policy should be regarding highway construction.

Highway programs of large magnitude are going forward at a rapid pace. Should these highways, built at public expense, be designed and constructed to take care of transportation that is not now adequately furnished by the railways, thus making them feeders to the railways, or should they be designed and constructed with a view to making them competitors for the transportation that is now taken care of by the railways?

If motor truck transportation is as economical, or more so, than rail transportation, we could ignore the issue altogether; but if rail transportation is the more economical, should not the army of men interested in railroads make their views known to the public, with a united front, as to what they are paying for motor truck transportation? This has no reference to short hauls, which is the legitimate field for the motor truck.

Again, should not the army of men interested in railroads use their influence on the public to get more adequate license fees for vehicles using the highways so as to transfer a more just proportion of original cost and maintenance from the taxpayer to the user who receives the benefits? Certainly no large body of our citizens are better fitted to educate the public along these lines than those interested in the railroads. If this feature of the highway problem is put before the public on the basis of the economics involved, results should be obtained that will benefit us all. Each individual acting independently would have some effect but united action should be certain of success.

AN EMPLOYEE.

Some Queries from a Station Agent

PRAIRIE PLAINS, U. S. A.

TO THE EDITOR:

I hope it is not true, as you seem to imply in your editorial note (May 6, page 1049) that the Central of Georgia never has to apologize for poor service except in connection with the quality or quantity of its locomotive service; for any road which was so nearly perfect as that would exercise a baneful influence—in the envy which it would inspire in the breasts of the men on other railroads who have to meet the public. Most of us have to try to utilize the "human equation" in a good many different directions to make up for all sorts of equations, human and other, which are not up to the mark.

You expect us local agents to have a lively imagination; but where are we to get the material for it to feed on? When our freight claim department takes three months to decide whether or not to pay a damage bill that I know ought to have been paid within a week, I confess that my imagination is not equal to making up a suitable excuse. I want a full explanation from the general manager, worded just as he would word it if the claimant were a friend of his (he is a friend of mine) and called in person at headquarters. I can, of course, expatiate on the virtues of our road, and claim that its love for its patrons is so great that a three months' wait for a $50 damage bill ought to be forgotten; but still I want to see the general manager's exact words—not a brief hint which he has never taken the time to put on paper.

Refusing to trust a consignee for a freight bill, or to accept his check, when he is a reputable citizen who is trusted everywhere else, is another feature in which an agent has to be able to spin out a large story of railroad virtues if he is to offset the determined ill-feeling of the patron. The man's freight bill may not be more than $25. Someone ought to estimate how much money is lost in a year, or a series of years, by a road which allows its local agents some discretion in this matter.

Please answer these questions. Then I will send you some more.

L. F. A.

But the Traffic Is Not Always Light

Salt Lake, Utah.

To the Editor:

The editorial in the issue of April 22, "Light Traffic an Aid to Construction," is interesting but some suggestions to the construction man may also be to the point. It is conceded that to a certain extent, at least, the use of the existing track is of great benefit in the construction of second track. However, under certain heavy traffic conditions work may be organized to avoid the use of the operated main line for construction purposes and in a way that may effect a saving in construction costs by eliminating delays to work trains attempting to use the operated main line.

The writer has in mind the closing of the gaps in the second track on the Union Pacific east of Granger in 1917, where a section 52 miles long was built with very little use of the existing main track. Traffic had reached over 70 train movements per day on single track. The schedule of passenger trains was such that the larger part of the day, from about seven in the morning until six in the evening, was free of passenger trains on this 52 miles. Naturally, the operating officers took advantage of this for freight train movements. A flock of seven or eight freight trains would reach one end of this piece of single track about 7 a. m. ready to be driven across. No sooner would the last one reach the other end of the single track than a flock from the opposite direction would take its turn.

The plight of the construction engineer with one or two work trains loaded with men and material can well be imagined. Five or six hours of this for a day or two soon brought him to time. He could get the chief dispatcher or the trainmaster on the telephone, but the voice on the other end, already with tears in it, would come back something like this: "Well, Mr. Man, you may know your construction end—we assume you do—but the general manager has told us what will happen if we do not get these trains over the road." The construction engineer had been an operating officer and understood "the language." On the other hand, that same general manager had said to the construction engineer that this piece of second track was worth something like a thousand dollars a minute to him.

The grading was therefore done by contractors with very little use of existing tracks. A Harris tracklayer was quickly installed at one end and an improvised tracklayer for handling rails with a bunch of teams for hauling ties, at the other. Everybody was happy at once. The tracklaying showed regular progress each day. Temporary bridges allowed the tracklaying to proceed with little delay; these were replaced later when time was easier. The cost of work incident to work train delay was eliminated.

It is well and good to do work when traffic is light but perhaps the gentleman at the head who furnishes the sinews of war is not always able to match up his "psychological moments." It is then up to the field man to meet the condition, and with a little ingenuity he may do this and perhaps show good progress.

W. R. Armstrong,
Assistant Chief Engineer, Oregon Short Line, Salt Lake City, Utah.

Educating and Training Railroaders

Milwaukee Shops, Wis.

To the Editor:

With reference to the letter from Chas. E. Parkes published on page 512 of your issue of March 4, in which some doubt is expressed as to what was meant by a certain statement in my paper on "Education" published in your issue of January 21, the paper in question was written for the Western Railway Club and your version of it was a considerably abbreviated one.

Had Mr. Parkes heard the full paper read, my meaning would have been made clear to him. The paper was an answer to a question arising out of a previous paper on "Regulation—Super-regulation—Strangulation." What I had in mind was that railroads were unable to obtain the assistance from educational institutions, which, for instance, the engineering, medical or legal professions might. The railroad situation is so complex that a man given any stereotyped course of training is not likely to be able successfully to grapple with its problems.

For instance, it is a comparatively simple matter to design and construct a car to carry a certain load, but when drawings are made it is found there are many requirements of the safety appliance law to be met and this will alter the design; next shippers' requirements enter into its construction, and when these have been met it is found that the cost of loading and unloading have been increased, and moreover changes must be made to permit of the car being repaired at small points where facilities are poor; and so on through various changes until the car has increased in weight and greater braking requirements become necessary; ultimately the average weight of a train has grown so as to interfere with track conditions, bridge strains, etc. Larger engines are necessitated, coal bills become higher, roundhouses have to be altered, turn-tables increased in length, etc., etc.

In every phase of railroading this dove-tailing throughout every move will be found until one realizes that it is necessary to have a very wide knowledge of railroad work in all departments before one can hope to attain success in his own particular branch. For this reason I believe it is simpler to take experienced railroad men and educate or teach them the requirements of modern improvements, altered designs and changed conditions than it is to take men who have had a good college or university education and teach them the various phases of railroading.

At the same time I strongly believe that the young man entering the railroad who has attended an up-to-date technical school is well equipped to commence learning the varied phases of railroading and I further believe that our educational institutions could develop a special course of training that would even better fit those wishing to take up this work.

In regard to Mr. Parkes' remark that most of the educational schemes yet inaugurated in railroads have failed I would say that we have no intention of allowing our scheme to collapse. It has been in operation for nearly four years now and by preparing and spreading the information among our employees and then holding monthly examinations, the results of which are duly recorded and used as a basis for promotion, we are going to continue to find among our employees men whose ability can be turned to mutual profit, that would otherwise remain in obscurity.

C. G. Juneau.
Master Car Builder.

President Harding has reached the conclusion that action in Congress on a St. Lawrence waterway must await the conclusion of a treaty between the United States and Canada. The Canadian government is evidently not very keen about pushing the international waterway project. Montreal doubts its value, and from an economic point of view Canada as a whole has little to gain from trying to extend direct ocean-going traffic into the distant interior. Our lake states have also very little to gain. They are obsessed by empty dreams of maritime grandeur. Postponement in Congress of this costly and vague project will help to clear away illusions. If such a route is to be opened at national expense it should be made perfectly clear that the whole nation will profit by it and that the enterprise will come within at least long range of paying for itself. No serious efforts have been made yet in that direction.—*New York Tribune.*

Motor and Inland Water Versus Rail Transport

Necessity for Each Paying Its Way, Instead of Burdening Taxpayers, Emphasized at Transport Meeting

By Samuel O. Dunn
Editor of the *Railway Age*

LONDON, May 19.

ATTENDANCE at the three-day Congress of the British Institute of Transport, which ended today, would have convinced any American student of transportation that, at least when rival means of transport are involved, human nature is precisely the same in Great Britain as in the United States.

There were papers and discussions on both motor highway transport and inland waterways, as well as specifically on railway matters. There were speakers who emphasized the principle, as is done in the United States, that in comparing the cost of water or motor transport with that of railway service the *total* cost incurred, not merely the rates charged the shipper, should be compared. It was emphasized that the rates charged the shipper do not measure the total economic cost of water or highway transport, because waterways and highways are built and maintained mainly from taxes paid by the general public, and these taxes must be added to the rates paid by the shipper before any fair comparison can be made between the costs of water, motor and railway transport.

On the other hand, as is almost always the case in the United States, the advocates and defenders of inland water and highway transport persistently evaded the issue thus squarely presented. None of them would discuss the question whether, including the expense of providing and maintaining inland waterways or highways, the total cost of transportation for considerable distances by them actually is more or less than the total cost by railway. They preferred —as is always true in the United States—to dwell upon the general advantages derived by the public from taxing itself to provide and support waterways and highways—as if even greater general advantages are not derived from the development of railways, especially if and when the development of the railways results in passengers and goods being transported at a lower total cost than they can be transported by other means.

Moved to Generosity With Another's Funds

The defenders of motor transport service rendered largely at the expense of the taxpayer dwelt so much upon the supposed indirect benefits derived by the public from it that they caused Sir Alexander Gibb to tell a story. He said they reminded him of the Scotchman who on a Sunday morning was so moved by the parson's sermon on the duty of generous giving that he emptied his neighbor's purse into the collection plate. Automobile manufacturers and shippers in Great Britain have the same generous willingness as in the United States to empty the taxpayer's pocket to increase their sales and reduce their freight bills, largely regardless of whether thereby the total cost incurred by the nation as a whole is reduced or increased.

As waterway and motor highway transportation, in comparison with transportation by rail, are the subjects of animated discussion in both the United States and Great Britain and as motor transport especially is relatively much more highly developed in the latter country than in most parts of our own, a summary of the papers and discussions on these subjects at the Congress of the Institute of Transport will be of considerable interest to many readers of the *Railway Age*.

Great Increase of Taxes for Highways

"The Finance of the Modern Highway—A Problem and a Solution" was the subject of a paper presented by Dixon H. Davies. Mr. Davies said that freight shipped by railway in Great Britain pays probably eight to twelve times as much toward the provision, upkeep and renewal of the road upon which it travels as does freight shipped by motor truck. On the other hand, he said, it is probably twice as expensive to provide, maintain and renew a suitable track for heavy motor traffic as to provide, maintain and renew a first-class railway. To a great and increasing extent the difference is not made up, but, on the contrary, the maintenance and renewal of the highways is running into arrear. This is occurring in spite of the fact that an increasingly heavy expenditure from local taxes is being made on the highways. The sum annually provided from this source is now about £40,000,000 annually. This is three times what it was in 1913; and other speakers pointed out that in 1913 there had been a large increase since a few years before. "The call upon the rates" (local taxes), Mr. Davies said, "has reached the dimensions of a grievous burden. . . . The Ministry of Transport is receiving applications from all parts of the country for the closing of roads against motor traffic. The roads approaching the part of London are so inadequate that the movement is reduced to an average of five miles an hour, and is subject to occasional blocks so that it is impossible to predict how long it will take to reach a particular dock.

Cost $22,500 to $450,000 a Mile

"The mileage of the English and Scottish roads is 177,306, of which 36,589 miles are already listed as classified roads. The cost of reconstructing a road for motor traffic varies from £5,000 to £100,000 ($22,500 to $450,000 in American money at the present rate of exchange) varying according to local circumstances and the weight of the traffic passing. It is difficult to see how any satisfactory scheme for equipping the country with motor roads could be carried through for a capital expenditure less than 500 millions sterling (about $2,250,000,000). The cost of this on a 5 per cent basis, with a provision for renewal every ten years would be about 65 millions ($292,500,000) per annum, and this would be required in addition to the revenue from rates (local taxes) which would be no more than sufficient for the ordinary maintenance and the costs of other unclassified roads. It is hardly to be expected that the country can be equipped with a complete system of arterial communication adapted for fast moving and heavy mechanical traffic for much less than two-fifths of the cost of the railway system, constructed as that was when wages and prices were very much lower."

Mr. Davies expressed the opinion that the public would never be willing to pay in taxes the sums necessary to provide and maintain such a system of highways. "One is driven to the conclusion that the only sound method is a direct charge on the traffic itself, which can be passed and ultimately met as part of the price paid for the articles carried. It is submitted that it is quite without reason or justice that the manufacturer, or the packer, or the printer who receives cotton or cotton goods by rail should be charged for the provision and upkeep of the road over which they

have travelled, and that the trader who receives corresponding goods by motor lorry should have a present made to him of nearly the whole amount of these costs."

He pointed out that under such a system there would be a natural tendency for more and more freight to leave the railway and go by the highway; that the railways would be forced, in consequence, to raise their rates on the remaining traffic; that this would drive still more traffic to the highway, preventing development of the railways and increasing the cost of the highway maintenance and the burden on the taxpayers; that finally the public would refuse to pay any more taxes to maintain the highway, the result being its deterioration and destruction under the increased business; and that thus finally transportation both by the railways and by motors on the highways would become inadequate and demoralized.

Tax on Motor Vehicles Should Be Greatly Increased

The only preventive of this ultimate outcome, he contended, is to make motor traffic contribute its fair share of the cost of providing, maintaining and renewing the highway. A motor truck now pays a tax of 30 pounds ($135) a year, which, on the assumption that it runs 30,000 miles a year, makes it a contributer to the roads to the extent of ¼ of a penny (½ cent, American money) per ton mile. In order to equate the position between road and rail this obviously inadequate tax should be raised to about 360 pounds ($1,620). There are at present approximately 180,000 commercial vehicles on the road, and the number is increasing so that a tax of 360 pounds would produce the 65 millions a year required, allowing for a considerable rebate upon commercial passenger vehicles.

"The objection to a heavy vehicle tax is that it bears so hardly upon those who do not keep their vehicles in regular occupation; for them the fairest tax is unquestionably the petrol tax. A good many of the objections raised to a petrol tax levied at the source might be met by the device of a recording petrol meter attached to the car."

As a means of making the total cost of transport by highway less than it is now, Mr. Davies suggested the making of "plateways" on and off which vehicles using the highway could move at their pleasure. He suggested the provision of these plate-ways by private capital which would be allowed to charge a toll for their use.

Sir William Acworth's Opinions

Sir William Acworth concurred in the principle that commercial traffic, moved by highway, like railway traffic, should be made to contribute its fair share toward the interest and maintenance charges of the highway. He advocated taxing highway vehicles on the basis of the mileage run by them as being the fairest to all classes of users of such vehicles. Several shippers and persons interested in the manufacture of motor vehicles or interested in their operation for commercial purposes vigorously attacked Mr. Davies' proposition that taxes should be levied on such vehicles in proportion to their use of the highways. They contended the levying of the present taxes already had had an adverse effect upon the motor industry. They claimed the burden put upon the taxpayers for the maintenance of the highways was exaggerated. The highways, they contended, are provided and maintained for the general welfare, and it would be inequitable to single out a particular class of users and make them pay in proportion to their use. At no point in the discussion did any of those who took this position meet squarely the proposition that it is inequitable and contrary to public policy for those who provide one means of transportation (railway) to be forced to charge rates sufficient to cover the cost of providing and maintaining the highway, as well as cost of carriage, while those who provide another means of transportation (by motor) are furnished a highway virtually at public expense and enabled to take traffic from the railway by making rates which cover the cost of carriage only.

Railway Seeks Power to Conduct Highway Transport

While this discussion was going on at the Congress of the Ministry of Transport, a Select Committee of the House of Commons was taking testimony on a bill promoted by the London & Northwestern Railway to give it the right to render motor transport service by highway. The bill is opposed by some shippers and others on the ground, among other reasons, that the London & Northwestern might so conduct its highway transport business as unfairly to compete with and drive out independent concerns furnishing motor transport. The London & Northwestern has agreed to the insertion of various provisions in the bill to safeguard against this. There is fear that if the bill is passed it will contain so many restrictions on the railway's freedom of action that it will not be very helpful in enabling it to meet motor truck competition.

Discussion of Inland Waterways

The trend of the discussion on inland waterways was the same as that of the discussion on motor transport.

Neville Chamberlain, a member of Parliament, presented a paper entitled "Inland Water Transport—A Practical Policy." Mr. Chamberlain is known in Great Britain as a politician who has advanced his career largely by his persevering advocacy of inland waterway development. He recalled that the report of the Royal Commission on Canals and Waterways in 1906 made a series of recommendations involving state ownership and state-assistance of waterways on a very considerable scale. He believed that if the recommendations of the commission had been carried out "the country would have recouped itself for the cost before now, but," he added, "there is no doubt that the very size and boldness of the conceptions defeated their own ends by frightening off the government and public of the day. Still less," he said, "would such proposals be likely to command assent today when costs have so enormously increased and when everyone is seeking how expenditures may be diminished rather than how new fields of enterprise may be developed. What we want is a new policy adapted to our times and likely to commend itself by its soundness and prudence to men of business.

A policy of waterway improvement must be founded upon expectations of increased business sufficient to give an adequate return upon the capital invested. But, he admitted, "there are no sufficient data in existence to enable anyone to make a reliable estimate of what that increase (in traffic) will be." Therefore, waterway development should proceed by steps, not all at once. The data secured as a result of each step will afford surer and more solid ground for the next advance. The waterway system of the country was divisible into a series of groups, each consisting of a central main route, fed by a number of auxiliaries. No "alarming sum" would be required to make the central artery a satisfactory waterway for barges of 100 to 120 tons.

Conditions of Successful Water Transport

He laid down three conditions which must be fulfilled. 1—Central management and control of each group of waterways. This would involve transferring from the railways the numerous canals they now control. 2—Properly equipped terminals. This would involve the expenditure of capital. Fortunately, the development of road transport in recent years had made it practical to construct great inland ports at a distance of several miles from the center of an industrial city from whence goods could be distributed either by rail, road or water. 3—Regular and punctual service, "the absence of which has been one of the principal causes of the failure of canals to give satisfaction to the

trader." He said he would prefer "that the whole thing should be left in the hands of private enterprise," but a large amount of capital must be invested, and he feared the returns may be for some time delayed, although he anticipated a very large indirect return in the additional prosperity of the localities served and the consequent increase in the wealth of the nation. "Therefore," he said, "the whole burden cannot be placed upon private enterprise, but there is a good case for inviting the co-operation of the principal local authorities interested, and, following the continental practice of the state itself."

Is Transport by Water Cheaper Than by Rail?

The discussion that followed forcibly recalled discussions of the same subject in the United States.

Sir William Acworth, whose writings on transportation are well-known in America, challenged the assumption underlying all the pro-waterway arguments in Europe as well as in America, that transportation on canals and canalized rivers is cheaper than by rail. From the standpoint of the public welfare he pointed out the cost of shipping by water that should be considered is not merely the rate paid by the shipper, but the *total cost,* including the interest on the investment in the waterway and the expense of maintaining it, which usually are defrayed from taxes paid by the public. He cited statistics based on European experience to show that in Germany and France this *total cost* by inland waterway almost always is greater than the corresponding total cost by rail.

As is usually true in the United States, this argument was ignored or evaded by the waterway advocates. Mr. Chamberlain answered that, in spite of Sir William Acworth's statistics, the people of Germany and France went on developing waterways. Was it to be assumed that they were ignorant of the facts about the results, or such imbeciles as to go on developing waterways when by so doing they were losing money which could be saved by shipping by rail? The influences exerted by politicians seeking to advance their careers by promoting waterways, and by business men desiring to save their own money by shipping partly at the taxpayer's expense, were ignored.

Canals No Longer Built by Private Enterprise

Sir William Acworth called attention to the striking fact that before the day of railways private enterprise had built canals because it could then operate them at a profit on the investment made in them, but that this has never been done since the advent of the railway.

The obvious implication was that a canal built without government aid could not be operated at a profit in competition with a railway likewise built without government aid, and that, therefore, differences of service considered, actual experience had shown that railway service could be rendered more cheaply. The advocates of waterways had no answer to this. Mr. Chamberlain finally dismissed foreign experience by contending that whether Great Britain's inland waterways could be made a success could be determined only by investing several millions of pounds in the more promising. He outlined a number of projects which he believed should be carried out, one after another.

The Work of the Institute of Transport

The Institute of Transport, at whose congress these discussions occurred, is an organization which was formed a few years ago and which is without a counterpart in the United States. Its membership consists of persons interested in all the various means of transport—by railway, waterway, highway and even airway. The papers and discussions deal with the problems of all these various means of transportation, and as discussions are participated in by representatives of all these various interests, the advantages and disadvantages of each means of transportation are presented by men who are entirely competent to do so. In the United States the railway, automobile and waterway interests have many separate organizations, but no common one in which they present their claims and counterclaims face to face where they can be at once challenged and analyzed.

One of the most interesting features of the Institute of Transport's sessions is the prominence of the men who take part in its sessions. The recent congress was not one of theorists. Several men famous for their writings and lectures on transportation matters actively participated, but there were also present and participating successful "practical" men representing all the branches of transport.

Besides the papers mentioned, there was one by Col. J. W. Pringle, Chief Railway Inspector of the Board of Trade on "Safety in Railway Operation," an abstract of which will be published separately in the *Railway Age.* "Wireless as an Aid to Transport" was discussed in a paper by Capt. H. Riall Sankey, "Foreign Railway Practice" by Prof. J. Carlier; and "The Operation of Heavy Suburban Passenger Services on a Steam Railway with Particular Reference to Density of Service, Terminal and Other Facilities" by F. V. Russell.

Railroad Y. M. C. A. to Celebrate Fiftieth Anniversary

ON JUNE 11, 1872, a reading room was opened in the Cleveland, Ohio railroad station and placed in charge of George W. Cobb, an active Y. M. C. A. worker. This was the first step in developing the Railroad Y. M. C. A., which now operates 269 buildings and has a total membership of over 125,000. In the fall of 1875 the Cleveland association temporarily released its secretary to interest other railroads in starting associations. As a result the work was started on several systems, including the Baltimore & Ohio at Baltimore, the Pennsylvania at Altoona and Jersey City, the New York Central at New York, Detroit, Columbus and Erie, and the New Haven at Springfield, Mass. Arrangements are now being made to celebrate the fiftieth anniversary of the Railroad Y. M. C. A. at the local associations on June 11, 1922, or sometime during that week. There will be a special observance at the Union Station in Cleveland, also a luncheon at the Hotel Commodore, New York, on June 16, at which President Truesdale of the Lackawanna will preside.

The following facts about the present scope of the work of the R. R. Y. M. C. A. are taken from a statement which has been issued in connection with the celebration of this anniversary.

The Association at Work

"Visitors to the various types of R. R. Y. M. C. A. buildings, ranging from the great ones in New York, St. Louis and Philadelphia to the small establishments in such towns as Hanley, W. Va., Field, B. C., and Hoxie, Ark., remark upon the strong place these hold in the affections of the men. They see the reason in the fact that these organizations—operating on a 24-hour schedule, and always open to railroad workers—provide homelike creature comforts, and acceptable, stimulating programs for mental an dmoral development and for physical recreation. And, seeing these things they rejoice that those in whose direct care lies the safe transportation of travelers and goods are not left to shift for themselves at isolated division points; but rather that they have a homelike place and care "at the other end of the run," to insure proper rest, wholesome environment and stimulus to the qualities that make for sound character.

"From the beginning the Railroad Y. M. C. A. has under-

taken a service to the sons and families of railroad men. In the early days this work was naturally limited, but during the years as the association has grown in numbers and extent, it has expanded accordingly, until at the present time many of the associations located in the smaller railroad communities are conducting very definite programs to the

A Few Facts from the Fifty Years' Record

	1875	1880	1890	1900	1910	1921
Number R.R. Y. M. C. A's	10	52	82	151	234	269
Total members	790	2,096	17,453	37,074	83,881	125,047
Value buildings and equipment	.....	.....	$410,002	$1,035,600	$3,991,980	$8,627,500
Operating expenditures	$3,600	$27,677	$126,607	$350,086	$1,216,758	$6,570,472
No. socials and entertainments	.....	71	609	1,116	2,477	5,049
Dormitories, times used	.....	.....	100,000	345,286	2,275,067	3,509,00
Restaurant, meals served	.....	.....	.....	997,654	4,930,100	9,374,000
Average daily attendance	.....	.....	4,739	23,500	50,933	63,072
In Bible classes	.....	.....	1,050	2,500	7,088	10,937
Number baths	.....	.....	156,697	450,461	1,468,748	2,330,000

families of railroad men and others as well as to the men distinctly in railroad employ.

"The association is not limited in its service to railroad men to the great cities, but very frequently finds its largest opportunities for helpfulness at the isolated and out of the way division points over a system. The physical features, such as dormitories and game room, have always been well patronized, but this does not constitute the entire service, which also includes educational work, social work and religious work—the secretary often being the only religious leader in the community—and other forms of association effort, such as work with the boys in the community, have made the association a centre from which has radiated all that is wholesome and best.

"Another phase of association service is the physical work particularly with reference to health and recreation. Programs of group games, such as volley ball, quoits, etc., during the comparaticely few minutes at noon hour, which are available to shop men, prove to be very popular. These and other games similarly organized for the road service men and office men prove interesting and helpful to large numbers of railroad men.

"The railroad men of tomorrow are the boys of today. The railroad associations realize that here is an opportunity for a service, the influence of which it is impossible to describe adequately. Through well organized boys' work, reaching these sons of railroad men in groups ranging from 12 to 18 years of age, the railroad departments conducting this program are endeavoring to hold before these coming railroad operators and managers the highest ideals of American young manhood."

What Men Who Know Say

"Eighteen years of association with the Railroad Y. M. C. A. has convinced me that nothing too good can be said about the work of this splendid organization. The ten branches established on these lines are ten centres of inspiration for all that is best in railway life—healthy exercise, comradeship, mental improvement, and the atmosphere of home. The high standard of citizenship which prevails among the railway men of Canada is due largely to the influence of the Y. M. C. A., the efforts of which to promote the mental and moral, as well as the physical well being of its members, have been highly successful."—*E. W. Beatty, president Canadian Pacific.*

"The Railroad Young Men's Christian Association serves the most useful purpose in bringing together the men of the various departments in a mutually helpful way, and also in throwing together in its varied program men and executives, thereby promoting a more friendly feeling which is of real value in the working out of our co-operative interest."—*Thos. B. Morton, moulder, Southern Railway, (president, Federated Shop Crafts).*

"I have been a member of the Railroad Y. M. C. A. for 15 years and cannot speak too highly of its work. It is a veritable haven and a source of comfort and strength. While the 'Y' ministers to physical needs it does not forget to minister to the spiritual. Many a man can thank the 'Y' for a helping hand and encouraging work when he was down and out, bracing him to face the battle of life once more. Would that all railway men would become members of this splendid organization and realize the benefits to be derived therefrom."—*William J. Swift, engineer, Michigan Central.*

"I feel that it has been of great service in many respects. Our officers are all enthusiastic in their praise of the results which have been accomplished by the Y. M. C. A. work. While it is impossible to assess a money value to the results which have been obtained, yet I do feel that there is a very high money value and which I feel satisfied is far in excess of the amount which the Company has paid towards helping maintain these institutions."—*W. J. Harahan, president, Chesapeake and Ohio.*

"I can heartily commend the work which the Railroad Department of the Y. M. C. A. has done in the past 50 years. There can be no doubt that it is a lasting influence for good in developing and raising the standards of life of the employees of the transportation systems of the country, and those responsible therefor can well be proud of their enviable record over this long period of years. The sphere of usefulness of the Railroad Y. M. C. A. has continually broadened to the mutual advantage of the railroads and their employees, and I know of no activity that has contributed more to establishing a closer and more cordial relationship between railroad men."—*Samuel Rea, president, Pennsylvania System.*

"By personal observation I know that the practical service which it so unselfishly renders contributes a very important part in successful operation, and if only from a purely business viewpoint, the branches inaugurated on our line 22 years ago have proved a paying investment. The Association work has constantly grown in favor, and is of inestimable value to both the railroad company and its employees."—*William T. Noonan, president, Buffalo, Rochester & Pittsburgh.*

In a Rear Collision on the Ulster & Delaware near Grand Gorge, N. Y., on May 26, six employees on a work train were killed. A freight train ran into the rear of the work train, crushing the caboose, in which the men were riding.

Photo by International

Fast Freight on Boston & Albany Wrecked Near Southville, Mass., by Bandits Whose Designs Were Against a Mail Train Due About the Same Time

Converting a Tunnel Into an Open Cut on a Busy Line

Bessemer & Lake Erie Adopts Interesting Measures to Effect This Improvement Without Delaying Traffic

By W. S. McFetridge,
Principal Assistant Engineer, and R. Ridgefield, engineer, Bessemer & Lake Erie, Greenville, Pa.

While the Work Was in Progress

THE BESSEMER & LAKE ERIE is now converting a double track tunnel of limited clearance into an open cut without interfering with traffic in a manner which has given rise to a number of interesting problems. This tunnel is located near Culmerville, Pa., on the main line of the Bessemer & Lake Erie. It was built in 1897 and is 394 ft.

Steam Shovels Working Over the Tunnel

long and 26 ft. wide at the springing line. The tunnel was designed for two tracks, although the clearance is very limited for present equipment.

The permanent lining consists of cut stone walls up to the springing line and a six-ring brick arch, with cut stone facades at the portals. The lower part of the tunnel is in shale rock but the overlying material is a mixture of clay, loam and soft shale.

Tunnel Has Given Trouble for Many Years

The tunnel is in a saddle in the hills and has always given trouble because of the seepage of water through the lining. The ground above the tunnel is bad and liable to slide, especially when wet. Considerable trouble was encountered with slides in building the tunnel and it was necessary to place a timber lining first and then build a permanent lining within the timber. Trouble was also encountered after the tunnel was in service and in 1909 a settlement in the arch required that heavy timber bracing be put in.

In 1909 a 5 ft. by 5 ft. timber-lined drainage tunnel was driven through the hill west of and parallel with the tunnel and about on a level with the crown of the arch, which relieved the situation somewhat in respect to water. This work was followed by a renewal of a part of the brick lining, and on the completion of the relining and the repointing of the brick, the tunnel was grouted.

Pipes three inches in diameter were put through the brick lining at the crown of the arch and cement grout was pumped through the pipes into the crevices and openings back of the lining by means of a grout gun. The pumping was continued at each pipe until no more grout could be forced into the cavities, the pipes being spaced from 25 to 50 ft. apart. About 2,000 barrels of cement and 75,000 brick were used in the above repairs.

This expedient proved effective for some time but in the winter of 1920-1921 bricks again began to spall out and the tunnel showed signs of a slight distortion. As a precaution-

Removing the Arch at the North End of the Tunnel

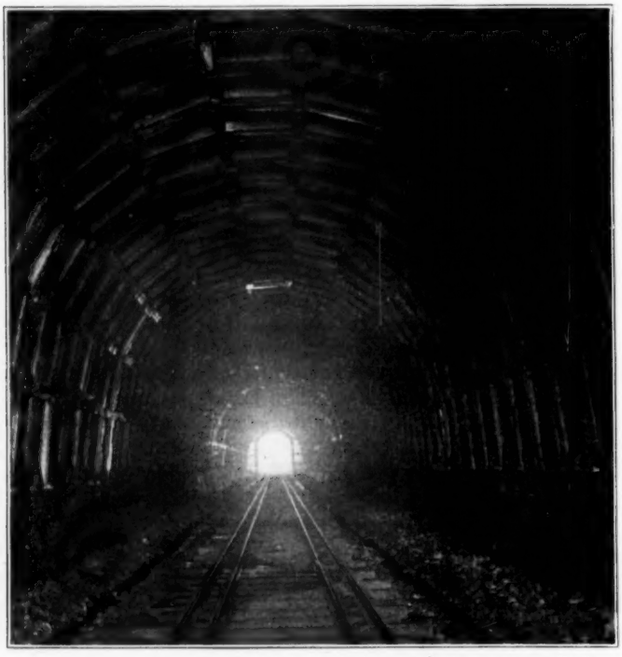
ary measure a further timber lining was put inside of the brick and the tracks were gauntleted through the tunnel. Studies were then made to determine whether to permanently reline and enlarge the tunnel or to make an open cut at the place by removal of the tunnel. The latter plan was adopted and on September 3, 1921, a contract was made with the Arthur McMullen Company of New York, for all the work

in connection with the removal of the tunnel, with the exception of the structural steel in the highway bridge, which was awarded to the American Bridge Company.

Highway Traffic Created Special Problem

At the time of the original construction the tunnel was probably cheaper than an open cut and it is more than likely that the conditions above the tunnel, involving litigation with property owners and extensive highway changes, influenced the decision for the tunnel. These same conditions exist today for five improved highways converge into one road crossing over this tunnel. The traffic over these roads is very heavy; on July 4, 1921, 87 pedestrians, 18 horse-drawn vehicles and 3,887 automobiles crossed over the tunnel. No detour for this road was possible during construction and, finally, the highway had to cross the cut on a bridge, practically in its original position, near the center of the tunnel.

Among the first considerations in opening up the work was



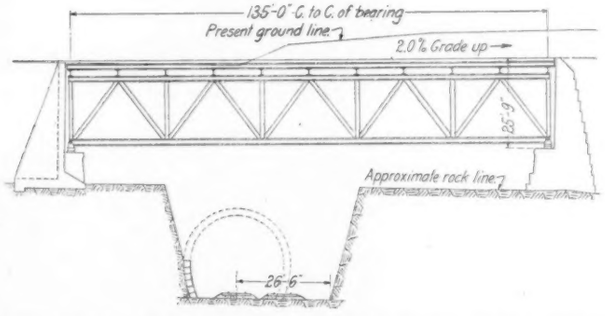
The Timber Lining in the Tunnel

the provision for the handling of highway traffic while building the highway bridge. A temporary road was graded across the south end of the tunnel and this road was used from the beginning of the work in September, 1921, until traffic was turned over the new bridge on April 1, 1922. No change is made in the location of the main tracks and the work has to be carried out so as not to interfere with traffic on the railroad. As the tunnel is on the main line with very heavy traffic and with no possible detour in case of a blockade of the tracks, the contractor is not allowed to use the tracks or to interfere with them in any way.

The method of procedure was to make the excavation in the cut down to the rock line from the north portal to the temporary road over the south end of the tunnel. When this excavation was completed in December, the work was in such shape that the abutments for the highway bridge could be built, these abutments being completed late in January. The steel bridge work was erected by the American Bridge Company during February, very little excavation being done in the cut while the bridge was being built.

The highway bridge is to have a reinforced concrete floor or pavement and as the winter weather prevented this from being placed at once after the erection of the steel work only the forms for the floor and the reinforcing bars were placed at that time and a temporary floor of 7 in. by 9 in. bridge ties was laid so that traffic could be turned over the bridge in order to release the temporary road and allow the work of excavation in the cut to be continued.

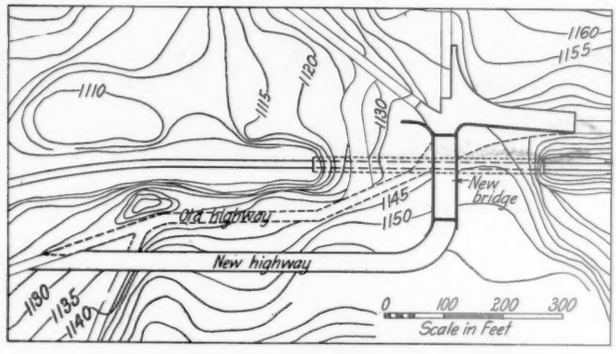
The permit for building the highway bridge required that the bridge be opened for traffic before the temporary road was removed and as there was no way of making a detour for the road it was necessary to get the permanent highway bridge in service as early as possible. For this reason the temporary floor was laid and the bridge put into service.



Cross Section of the New Cut at the Location of the Bridge

This floor is laid so that one-half can be taken up and the concrete floor put in while the other half is in use. After the half floor of concrete is sufficiently cured traffic will then be turned over it and the other half built.

The abutments for the bridge are of a general U shape with curved wings to provide easy approaches to the bridge. The abutments are both of the gravity type and the bridge is centered over the center line for four tracks or off center for the present two tracks, thus providing for the widening of the cut for two more tracks on the east of the present tracks whenever four tracks become necessary without further



It Was Necessary to Relocate Five Highways

changes in the bridge. The concrete was placed during the winter months but, owing to the open season, elaborate methods for preventing freezing were not required, the ordinary precautions of heating all of the materials and keeping a canvas cover over the concrete with fires around the abutments and steam lines under the covering sufficed for the work. The foundations were placed in the shale rock found in the lower part of the excavation, the berm between the rock slope and the earth slope being about at the top of the foundation course. The entire construction of the bridge is much heavier than ordinarily used as it provides for future electric cars in addition to the 16-ton trucks which are now permitted for highway traffic.

During March good progress was also made in the widening of the east slope of the cut south of the tunnel, the material above the rock line being excavated with traction shovels and auto trucks. Since April 1 the excavation of the cut over the tunnel has also been pushed to the limit of the amount of plant which can be handled economically in the limited area. Also, beginning at the north portal of the tunnel, where the top excavation was completed several months ago, the work of stripping the brick arch of the tunnel has been in progress. This work has been done by hand below the rock line, the material being loaded in skips and handled to the dinkey cars by stiff leg derricks erected on the rock berm of the cut.

The Removal of the Tunnel Arch

The stripping of the arch has been of particular interest because of the fact that it revealed the results obtained by pumping the grout in behind the arch in 1910. It has been found that, except in a few places just over the crown, the entire tunnel excavation behind the lining was a solid mass of concrete, in which the original timbering and the stone packing between the timbering were imbedded.

The method used in opening up the tunnel has been to remove the original rock and shale material to expose the concrete encasing the tunnel arch. A row of holes is then drilled around the arch through the concrete but not extending into the brickwork and the grouted concrete is broken up by very light shooting. The material can then be removed by pick and shovel, leaving the brick arch exposed. The brick arch is then drilled and a section about three feet long around the arch is shot off by light charges in the holes. This shooting is done very lightly and is intended to loosen the brick so that they can be handled by pick and shovel men working on top of the arch. All but the inner ring of brick is being removed in this manner, this last ring being knocked down onto the track where the material is thrown to the sides at once, to be picked up later as the opportunity between trains affords. The timber lining is removed later, or at the time the brick is torn down. It is to be noted, however, that the timber rings inside the tunnel serve as a support so that a considerable length of one ring of brick has been left standing during a day when a section of the brick arch is being taken down. This work of taking down the brick arch has been done on Sundays when it has so happened that the traffic on the railroad has been very light, but it can be carried on at any time.

Various features of this work have proved of special interest. In taking out the top lift of the excavation the improved highways were utilized by the contractor who secured various dumping grounds along these roads and used auto trucks loaded by traction shovels to remove and dispose of a great deal of the excavated material. The sand and coarse aggregate for the abutments were also brought to the work by auto trucks and delivered at the mixer by the dealers supplying the material. This material was only supplied as fast as required so that no large amount accumulated on the work, which was desirable on account of the work being done during winter weather.

The main dumping ground for material excavated on this work is located about half a mile north of the tunnel and is reached by a dinkey track laid on the railway right-of-way. All of the material excavated below the rock level is being hauled to this dump.

It was first planned to take practically all of the excavated material to this dump but owing to the possibility for the use of auto trucks to handle it the contractor arranged with various owners of property having low grounds along the improved highways, to fill in their property for them, and thus disposed of a large portion of the top cut, the improved highways furnishing excellent roads to haul this material over. Owing to the poor quality of the material over the tunnel and on account of its running and sliding qualities when wet, none of it was dumped in the railroad embankments, and all of it was wasted, or used in filling low ground.

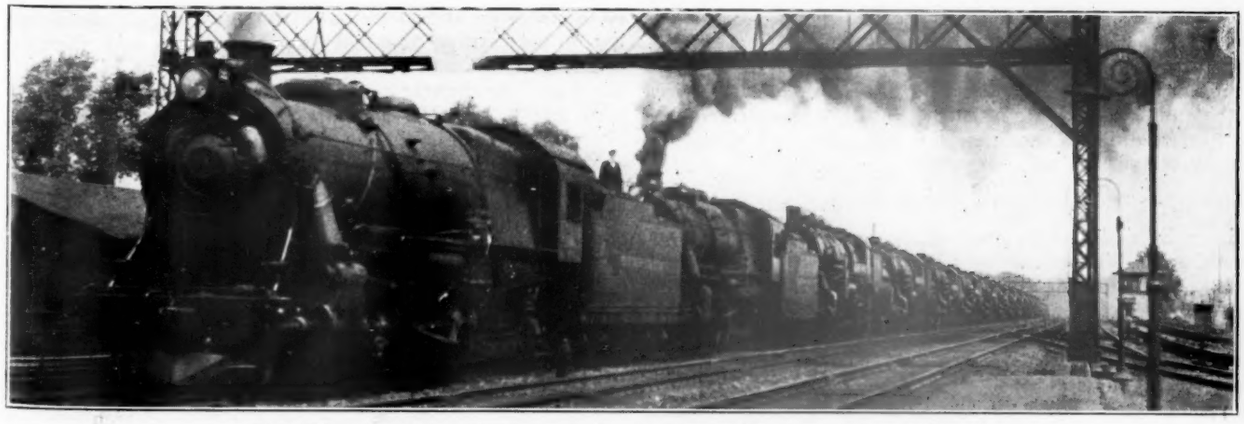
The work embraced 100,000 cu. yd. of excavation in cut, 12,000 cu. yd. of excavation for changes in highways, 285,000 lb. of structural steel, 2,000 cu. yd. of foundation excavation, and 1,700 cu. yd. of concrete. The entire work will be completed this spring.

This work has been handled under the direction of the writers and under the general supervision of H. T. Porter, chief engineer of the Bessemer & Lake Erie. Thomas McGuire, superintendent for the Arthur McMullen Company, contractors, is in direct charge of the work and is responsible for the development of many of the methods described above.

The "Prosperity Special"

THE BALDWIN LOCOMOTIVE WORKS, which has recently completed for the Southern Pacific fifty 2-10-2 type freight locomotives, oil burners, has sent 20 of them in a single special train to East St. Louis, Ill., over the Pennsylvania Railroad; and it is expected that they will arrive in that city on Monday, June 5. From East St. Louis they will be sent over the St. Louis Southwestern to Corsicana, Tex., where they will be delivered to the Southern Pacific.

This train left Eddystone, near Chester, Pa., on May 26 at 11 a. m., and should arrive at East St. Louis on Monday, June 5, at 6 p. m. The movement was by way of Wilmington, Del.; Perryville, Md.; Harrisburg, Pa.; Altoona, Pa.;



Special Train of Twenty Locomotives Leaving Eddystone, Pa., on May 26

Pittsburgh, Pa.; Crestline, O.; Ft. Wayne, Ind.; Richmond, Ind.; Indianapolis, Ind., and thence to East St. Louis.

Except on steep grades the train is being moved by three Pennsylvania locomotives, two in front and one pusher. Around the Horse Shoe Curve, six or more engines are required, divided between the front, middle and rear of the train. This train is nearly a half mile long, each locomotive with its tender measuring about 100 ft. in length. The train weighs, exclusive of the locomotives propelling it, over 6,000 tons.

The train travels only in the daytime and, to promote the object suggested by its name the locomotives are to be exhibited at the principal cities on its route, circulars being sent in advance calling the proposed exhibition to the attention of boards of trade, school authorities, public officers and citizens generally.

At Eddystone on the departure of the train there was an impressive ceremony at a specially erected grandstand alongside the Pennsylvania railroad tracks. Messages from Governor Sproul and President Harding were read by J. P. Sykes, vice-president of the Baldwin works. Speakers at the demonstration in addition to Mr. Vauclain were Elisha Lee, vice-president of the Pennsylvania; Richard Weglein, president of city council, and John P. Sykes, superintendent of the Baldwin works. Senator G. W. Pepper sent a letter explaining that the was unable to be present as he had planned, and conveyed the congratulations of President Harding.

The fact was recalled that in 1898 the Baldwin works shipped a long train of locomotives for the Chicago Elevated Railroad in similar fashion. Those were small engines of the Forney type.

Railroads Act on Commission's Freight-Rate Decision

THE EASTERN railroads—about 60 executives being present—voted on May 29 to comply with the decision of the Interstate Commerce Commission issued last week (*Railway Age,* page 1221) calling for a general reduction in freight rates, but to protest against the decision fixing 5¾ per cent as a reasonable annual income for the railroads. Following the conference L. F. Loree, chairman of the conference, issued a statement saying:

"* * * Since the commission finds that rates in excess of those determined by it shall be unreasonable after July 1, 1922, it was felt that the roads had no alternative except to put the rates in effect without a formal order.

"The roads also determined to enter a formal protest of the finding of the commission that on and after March 1, 1922, the fair return, as contemplated by the Transportation Act, will be 5¾ per cent, believing that this return is lower than is required by law and will not enable the railroads to finance themselves to the extent that they should be able to do in order to render adequate service to the public. * * * If the future demonstrates the need for additional revenues, the railroads feel confident that the commission will take steps to grant relief."

Southeastern Roads Accept

Executive and traffic officers of the southeastern roads, at a meeting in Washington on Monday, May 29, decided to put into effect the reductions in rates prescribed by the Interstate Commerce Commission without the issuance of a formal order, and a letter was addressed to the commission advising it of that fact. The roads do not concede that the reduction was justified but see no object to be gained in compelling the commission to go to the length of issuing a legal order. They also express the hope that the increase in traffic which has been in progress for some time will continue so as to enable them to stand the reduction, even if the reduction itself does not cause any increase in business. W. R. Cole, president of the Nashville, Chattanooga & St. Louis, presided at the meeting. Consideration was also given to the details of getting tariffs ready for publication to become effective on July 1 on ten days' notice.

The Southern carriers in their letter to the commission said they do not accept all the reasoning by which the commission reached its judgment and specifically they except to the finding of the commission that a fair return is or will be 5.75 per cent. "They further specifically except to the conclusion that a general reduction in rates in the Southern group is at this time justified and can only express the hope that further reductions in labor costs where warranted and a substantial increase in traffic will yield results more nearly approximating a reasonable return upon the aggregate property value and so justify their action in the premises."

Conference with I. C. C.

The committee of railroad executives appointed following the White House dinner at which the President urged voluntary reductions in freight rates on basic commodities, held a further long conference with the Interstate Commerce Commission at Washington on May 25, pursuant to appointment made before the issuance of the rate decision, but no announcement was made except that "further discussion of the questions under consideration continued, including the bearing and effect of the recent decision of the commission relating to reductions in freight rates." At the conclusion of the meeting the railroad executives stated that the subject would be reported to their associates in the several portions of the country, at meetings to be held early this week, for further consideration, but that before leaving Washington it was their purpose to call upon the President "so as to express their appreciation of his interest in the general subject." The executives then went to the White House, where they remained about 15 minutes.

Secretary Hoover, who is credited with having inspired the effort of the President to induce the railroads to agree on a program of voluntary reductions in the rates on basic commodities in place of the general reduction prescribed by the Interstate Commerce Commission, expressed considerable disappointment with the outcome, although recognizing some of the difficulties of the situation. In commenting on the rate decision, he said he was inclined to agree with the minority members of the commission who favored reductions in basic commodities rather than spreading the reductions over all traffic. He said that a reduction of ten per cent in rates on silk, for instance, will do no good and that as far as the higher grade articles and luxuries are concerned "the money would better be used to employ labor to repair cars." If the commission cannot reduce rates in accordance with the value of commodities and at the same time give proper consideration to the earning power of the railroads, he said, the fact emphasizes the need for an entire readjustment of the rate structure. He thought probably some of the railroad executives might ask relief from the decision as to the rates on high grade articles.

Mr. Hoover said, however, that the Interstate Commerce Commission was faced with many difficulties because of the complexity of the situation and the differing degrees of dependence of different roads upon different commodities.

Secretary Mellon of the Treasury Department was quoted in the press as having suggested a five-year holiday from rate regulation, on the ground that if freed from restrictions the railroads could adjust their rates to meet varying conditions.

As we go to press the only word from the Western roads is that they will further consider the decisions of the Eastern and Southeastern lines before taking definite action.

Labor Board Cuts Wages of M. of W. Employees

Reduction of Five Cents An Hour for Unskilled Workers Effective July 1. Labor Group Dissents

AFTER JULY 1, the rates of pay of maintenance of way employees and railway shop laborers will be reduced slightly more than 13 per cent under the terms of the first of a series of wage reduction orders announced by the Railroad Labor Board on May 28. The lower rates of pay were agreed upon by the three railroad representatives and the three public representatives on the Board, the two groups constituting the majority necessary to hand down the ruling.

The three labor members on the Labor Board voted against the ruling and attached thereto a lengthy dissenting opinion vigorously denouncing the decision of the majority.

The Board's decision adopts as a base the rates fixed in Decision 147, the last wage decrease, from which the following decreases per hour are authorized:

"Sec. 1. Bridge, building, painter, construction, mason and concrete, water-supply, and plumber foremen (except water-supply and plumber foremen coming under the provisions of Sec. 1 of Article IV, Decision 147.).....5 cents

Sec. 2. Assistant bridge, building, painter, construction, mason and concrete, water-supply, and plumber foremen, and for coal wharf, coal-chute, and fence-gang foremen, pile-driver, ditching and hoisting engineers and bridge inspectors (except assistant water-supply and plumber foremen coming under the provisions of Sec. 1 of Article IV, Decision 147).....5 cents

Sec. 3. Section, track and maintenance foremen, and assistant section, track and maintenance foremen.....3 cents

Sec. 4. Mechanics in the maintenance of way and bridge and building departments (except those that come within the scope of agreements with the Federated Shop Crafts).....4 cents

Sec. 5. Mechanics' helpers in the maintenance of way and bridge and building departments (except those that come within the scope of agreements with the Federated Shop Crafts).....1 cent

Sec. 6. Track laborers, and all common laborers in the maintenance of way department and in and around shops and roundhouses not otherwise provided for herein.....5 cents

Sec. 7. Drawbridge tenders and assistants, pile driver, ditching and hoisting firemen, pumper engineers and pumpers, crossing watchmen or flagmen, and lamp lighters and tenders.....5 cents

Sec. 8. Laborers employed in and around shops and roundhouses, such as engine watchmen and wipers, fire builders, ashpit men, flue borers, coal passers (except those coming under the provisions of Sec. 3 of Article VIII, Decision 147), coal-chute men, etc. ..... 5 cents

Sec. 9. For miscellaneous classes of foremen and other employees named in connection with a carrier affected by this decision, but not specifically listed under any section in the classified schedules of decreases, deduct an amount equal to the decreases specified for the respective classes to which the miscellaneous classes herein referred to are analogous.

Wages of M. of W. Employees Have Not Been Standardized

In discussing the new wage scale, the Board in its decision said in part:

The wages of this class of employees have not been standardized and made uniform throughout the country, as many people seem to think. Prior to Decision No. 2, they were not so standardized, and the increases made by that decision were arrived at by adding to the various existing rates a uniform increase of a certain number of cents per hour.

To illustrate the "absence of uniform standardization of the wages of the classes of employees herein covered" the Board cited the rates prevailing under Decision 147 on the Illinois Central, the Southern, the Chicago Great Western, the Northern Pacific, the New York Central and the Atchison, Topeka & Santa Fe and showing that the rates of pay of track laborers, for instance, range from 28 cents per hour to 40 cents per hour.

"As a matter of fact, the 28 cent rate is found on only a few roads and applies to a comparatively small number of employees," the Board added.

Reduced Rates of Pay Still Above Industrial Levels

The decision continues:

The Labor Board is of the opinion that after the reductions made under this decision, common labor on the railroads will still be receiving, as a rule, a wage in excess of that paid to similar labor in other industries, and that the same will be true of all other classes of labor covered by this decision. The Board is of the opinion, however, that the hazards and hardships of the employment, the training and skill required, the degree of responsibility to the public, and other elements mentioned in the statute combine to justify the payment of a better wage to these employees than is paid to similar labor in outside employment.

On a very considerable number of the roads, the foremen and section men are furnished living quarters and fuel by the carrier.

Moreover, the Board is not in sympathy with the idea that a governmental tribunal, empowered to fix a just and reasonable wage for men engaged in serving the public in the transportation industry, should be controlled by the one consideration of the low wages that may be paid to other labor in a period of temporary depression and unemployment. It is but just to say that railway managements have indicated no desire for such a result.

Based upon the evidence before the Board, the statistical department of the Board has made a study of the comparative purchasing power of the wage herein fixed for so-called common labor and the purchasing power of the wage paid such labor on the railroads in December, 1917, immediately prior to government control of the carriers; in January, 1920, just prior to the termination of federal control; on May 1, 1920, the effective date of the decision No. 2; on July 1, 1921, the effective date of Decision No. 147; and in March, 1922.

The result of this study is as follows:

Average Hourly Rates	
December, 1917	19.3c.
January, 1920	37.7c.
May, 1920	46.3c.
July, 1921	37.7c.
Under present decision	32.7c.
Percent of Increase in Average Hourly Rates Over December, 1917	
January, 1920	95.3%
May, 1920	139.9%
July, 1921	95.3%
Under present decision	69.4%
Increase in Cost of Living Over December 1917	
January, 1920	40.0%
May, 1920	52.0%
July, 1921	26.7%
March, 1922 (latest available Government data)	17.2%
Percent of Increase in Purchasing Power of Earnings of Subsequent Dates as Compared with December, 1917	
January, 1920	39.5%
May, 1920	57.8%
July, 1921	54.1%
Under present decision	44.5%

Although average hourly earnings of this class of employees are below the earnings prior to Decision No. 2 by five cents per hour, their value is 3.6 per cent greater due to the decrease in cost of living. The cost-of-living figures set out in the foregoing tables have been compiled by the reports of the United States Department of Labor and are for the latest date for which such data are available.

Regulations Governing the Application of the Decision

Among the general regulations governing the application of this decision, are the following provisions:

Sec. 1. The provisions of this decision will not apply in cases where amounts less than $30 per month are paid to individuals for special service which takes only a part of their time from outside employment or business.

Sec. 2. Decreases specified in this decision are to be deducted on the following basis:

(a) For employees paid by the hour, deduct the hourly decrease from the hourly rate.

(b) For employees paid by the day, deduct eight times the hourly decrease from the daily rate.

(c) For employees paid by the month, deduct two hundred four (204) times the hourly decrease from the monthly rate.

Sec. 4. It is not intended in this decision to include or make

decreases in wages for any officials of the carriers affected except that class designated in the Transportation Act, as "subordinate officials," and who are included in the act as within the jurisdiction of this Board. The act provides that the term "subordinate officials" includes officials of carriers of such class or rank as the Interstate Commerce Commission shall designate by regulation duly formulated and issued. Hence, whenever in this decision words are used, such as "foremen," etc., which may apply to officials, such words are intended to apply to only such classes of subordinate officials as are now or may hereafter be defined and classified by the Interstate Commerce Commission as "subordinate officials" within the meaning of the Transportation Act.

The decision of the Board with respect to the wage reductions, as outlined in the specific paragraphs given above, is effective on those roads and with respect to those particular classes of employees that were specifically named in the submissions made to the Board by the various railroads. The decision includes a long list of all railroads indicating in each case what classes of employees are affected.

Dissenting Opinion of the Labor Group

The dissenting opinion, signed by A. O. Wharton, Albert Phillips and W. L. McMenimen, labor representatives on the Board, gave the following as specific reasons for the refusal of these members to join in the majority opinion:

(1) The rates of pay established under this decision as the basic minimum rates of the transportation industry will merely perpetuate the low level of purchasing power possessed by this large class of workers in pre-war years. The opinion expressed in the majority decision, that "The Board is not in sympathy with the idea that a governmental tribunal, empowered to fix a just and reasonable wage for men engaged in serving the public in the transportation industry, should be controlled by the one consideration of the low wage that may be paid to other labor," would seem to indicate a feeling that the decision should not perpetuate the injustices of a former unregulated period. We show clearly the fallacies of attempting to show that the rates of the decision will mean increased purchasing power over pre-war levels.

(2) The rates of pay established under this decision will mean annual earnings far below any minimum standard of subsistence which has been formulated, even below those of most conservative employer groups.

(3) The rates of pay established under this decision are not based upon the human needs of the hundreds of thousands of families involved. They are insufficient to provide these families with the absolute essentials. The earnings of this large group of railroad employees will not provide the father of a family with as much food as is allowed convicts in the Cook County, Ill., jail.

(4) The pre-war standard perpetuated by this decision was the product of inequitable wage bargains. It was considerably below the level recognized at that time as necessary for the maintenance of health and energy.

This opinion, much more voluminous than the decision itself, also includes a lengthy analysis of part of the majority decision in part as follows:

The statistical study of the comparative purchasing power of the wage for common labor fixed by this decision and the purchasing power of the wage paid such labor in December, 1917, which serves as the major justification in the majority report, is unfair and misleading.

In the first place it fails to take account of the change in the number of hours constituting the basic working day as between the two periods. During the period covered, the basic day was reduced from 10 hours to 8 hours. According to Wage Series Report No. 3 issued by the Labor Board, the average daily rate of pay for this class of labor was $1.93 in December, 1917, and will be $2.62 under this decision. This shows a wage increase amounting to 35.8 per cent, not 69.4 per cent as stated. This would bring a consequent reduction in the figure for the increase in the value of earnings from 44.5 per cent, the figure in the majority report, to 15.9 per cent, which is the correct figure.

The Railroad Labor Board has decided that 8 hours shall constitute the basic day for this class of labor, and it must, therefore, in good faith, recognize that the basic earnings of these employees under the decision will be only 35.8 per cent above the level of December, 1917, meaning an increase in purchasing power of only 15.9 per cent instead of 44.5 per cent as stated in the majority report.

In the second place, consideration of the entire comparison forces one to the conclusion that the period chosen presents an unfair picture. During the period 1915 to 1917 the cost of living had been rising far more rapidly than the wages of this class of employee. In other words, the $1.93 per day representing the average wage in December, 1917, meant a lower purchasing power than the average wage in 1915.

It is hardly necessary to point out that a fairer comparison would have gone back to 1915. In that year, according to the Interstate Commerce Commission, the average hourly earnings of section men were 15 cents. For the 10-hour day this meant earnings of $1.50. Comparing this with the earnings for the standard pay under the majority decision—namely, $2.62—we find that the level of money wages will be 74.4 per cent above the 1915 level. According to United States Department of Labor reports the cost of living in March, 1922, was approximately 60.5 per cent above the average for 1915. Combining these two figures we arrive at the correct per cent by which the value of a section man's wages under the majority decision will exceed the value of his wages in pre-war days. It amounts to only 8.7 per cent instead of 44.5 per cent as indicated in the majority report.

There is a third way in which the majority report fails to show the real effect of this decision upon the value of the wages of common labor in the maintenance of way department. The statistics presented deal only with section men. There are roughly 100,000 other unskilled workers who will also be affected by the decision. In the Interstate Commerce Commission classification these are classed as "other unskilled laborers." In the Labor Board's Wage Series Report No. 3 the number of "other unskilled laborers" is set down as 108,977.

According to the Interstate Commerce Commission report for 1915, this group received an average hourly rate of 18.2 cents in that year. Under the majority decision this same group will average approximately 35.9 cents per hour. Extended to a daily basis this will mean $2.872 for the standard work day compared with $1.82 in 1915. In other words, the money wages of this group of employees under the decision will be only 57.8 per cent above those which they received in 1915. This contrasts with an increase in the cost of living, already noted, of 60.5 per cent, showing a decrease of 1.7 per cent in value of their earnings.

Combining the two classes of unskilled employees in the maintenance of way department, we have approximately 180,000 men who will receive money wages for the standard day under the decision only 69.7 per cent above those which they received in 1915. In other words, the increase in the real value of the wages of this group as between the two periods will only amount to approximately 5.7 per cent.

New Rates of Pay Correspond With Minimum Wage for Women

There followed a long argument, replete with statistics, to show that the minimum rates of pay established by this decision correspond closely with the minimum wage for women without families to support as established in different states and that the pre-war wages of these employees were "inadequate."

"It is obviously unjust to expect the railroad employees," the minority opinion continued, "who should be responsible for the maintenance of families to endure wages at a level designed as the minimum for the support of single women. Such a comparison shows the inherent absurdity of expecting a male employee to renew his strength and to maintain his home from day to day on the wages provided in the majority decision."

The pre-war wages of this class of workers were established in a labor market which to all intents and purposes was subject to no regulation. The carriers bought this labor as a commodity at the lowest possible figure. Just and reasonable wages could not result from such a process which is the very antithesis of the function which the Labor Board is supposed to perform under the Transportation Act. It seems strange that a responsible body created to establish just and reasonable wages, with certain clearly defined principles laid down, should arrive at wage rates so closely approximating the value of those arising in an utterly unregulated labor market.

"Living, Subsistence and Saving" Wages Discussed

The dissenting opinion then launches into an extensive discussion of "living," "subsistence" and "saving" wages, budgets for the employees involved (even to the point of quoting specific menus, the number of calories therein necessary to maintain a worker and his family), and closing with the statement that "the most important grounds for dissent from the majority decision lie in the contrast between the wage therein provided and any minimum standard of sub-

sistence which has ever been suggested whether by governmental or state departments, investigators for charitable institutions, city bureaus, or by representatives of labor. The wages provided in the decision will enable the average employee of this class to secure little more than one-half of the necessities specified in the majority of these budgets as absolutely essential. This decision will provide the section men with only about two-thirds of the goods provided by the lowest budgets of the National Industrial Conference Board. As a matter of fact the minimum rates under this decision will scarcely buy the food part of the minimum subsistence budgets which will be cited, with nothing left for clothing, rent, furniture, heat, light and other essentials.

"It is clear, then, that on the basis of the rates of pay established under the majority decision, some quarter of a million railroad employees, an entire class, must forego the thought of a family in order to be sure of enough food to keep themselves from actual starvation. With the development of families under-nourishment will immediately appear."

Labor's Reaction to the Order

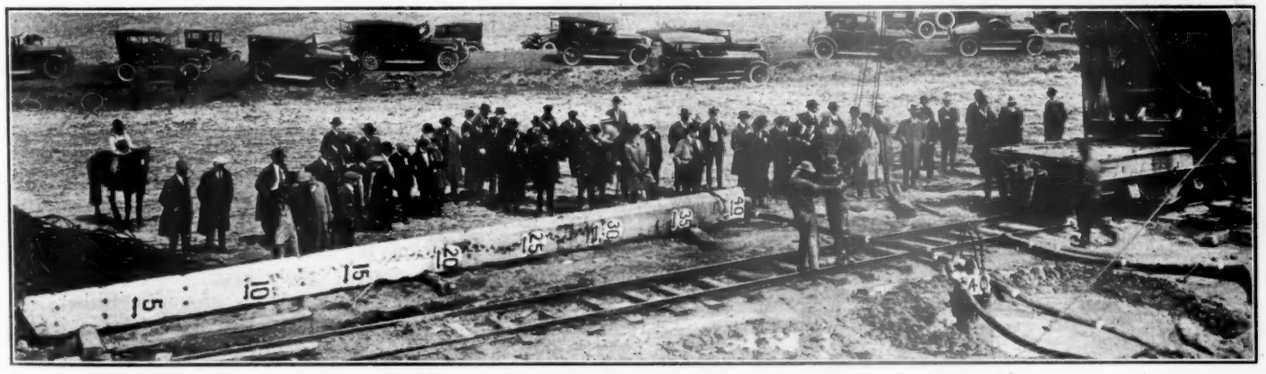
The usual quota of comments by labor leaders and railroad executives followed the announcement of the Board's wage cut order and by Wednesday attention was centered on what reception the new rates of pay will receive from the officers of the union whose membership is involved. The latest report from the Detroit headquarters of the United Brotherhood of Maintenance of Way employees and Railway Shop Laborers indicated that the executive council of that organization favored the rejection of the lower rates of pay and the submission to its membership of a strike ballot. E. F. Grable, grand president of the Maintenance of Way Brotherhood, had previously predicted that a strike vote would be ordered but explained that a strike would be called only if the referendum of the brotherhood membership favored it. It is probable that the action of the maintenance of way organization will depend upon the action taken by the Federated Shop Crafts who are facing a comparable or larger cut in their rates of pay as the result of another order of the Board which is to be handed down in the immediate future. B. M. Jewell, president of the Federated Shop Crafts, has already termed the cut in wages of maintenance of way employees as "unwarranted" and "indefensible." Mr. Jewell opened his campaign against the impending wage cut by requesting a conference with the members of the Railroad Labor Board at which a formal request was made for immediate action on all charges of violations of the Board's orders by various carriers. Mr. Jewell has indicated that the strike ballot which he will send out will embody three questions: The first on the contracting of shop work; the second on the elimination of time and one-half for overtime for the ninth and tenth hours of consecutive service; and the third on the question of reduced rates of pay. All of the strike talk carries the threat of a general walkout on the part of those railway employees affected by the Board's recent decisions some time between July and September.

Wage reduction orders of the Labor Board do not follow the recent freight reduction order as "the effect of cause." Chairman B. W. Hooper of the Board has frankly stated that the Interstate Commerce Commission's order would in no way influence the Board in reaching its wage decision. Wage reduction orders involving all other classes of railway labor involved in the recent controversy over wage scales will be issued in time to become effective on July 1 according to representatives of the Board.

Pile Jetting Tests Show Unusual Results

A REMARKABLE DEMONSTRATION of pile jetting was conducted on April 26, near Omaha, Neb., in the presence of a large crowd of spectators, including a number of prominent railway officers. The piles employed in this test were the Bignell reinforced concrete piles which have been in use for a number of years in locations where the use of reinforced concrete was desirable and where conditions made jetting of the piles imperative or of considerable advantage. The test was conducted by the Woods Brothers Construction Company of Lincoln, Neb., for the purpose of showing the advantage of this form of piling.

The Bignell piles are equipped with a four-inch pipe extending through the center for the entire length which is attached to a one-inch nozzle at the bottom and with small outlets on all four sides at intervals throughout the entire length. Thus, water delivered through this pipe not only serves to bore a hole to receive the pile in its downward movement but also insures thorough lubrication throughout its entire length. As a consequence, these piles will sink of their own weight as long as the water is kept running where the soil conditions are in any way favorable for jetting.



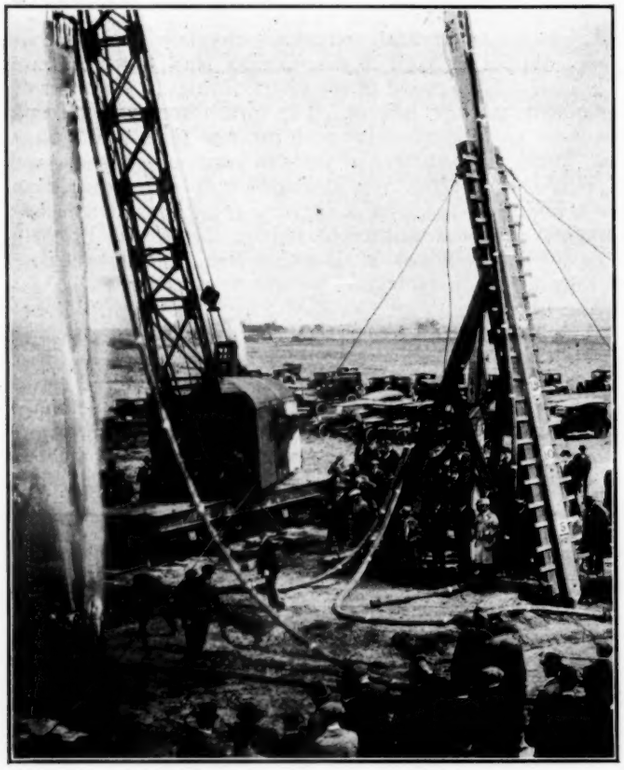
After the First Sheet Pile Was Sunk, the Second Was Driven Beside It

One photograph shows the Bignell sheet pile for use in sea wall, dock construction, etc. The one shown in the picture is 10 in. in thickness and has a 20-in. face. The sheet piles may be made in any thickness, width and length that accords with reasonable requirements. They are reinforced and are sunk in the same manner as the other Bignell piles. The tongue of one fits into the groove of the other making a water-tight wall. If it is desired, thin wood sheets may be inserted in the groove and as these expand with a greater content of moisture they afford a further assurance of water-tight construction. The point of the pile is bevelled somewhat which tends to force it against the pile

previously driven as it makes its way downward to the desired depth.

The demonstration was made in Missouri river bottom land. The first test was the sinking of 40-ft. sheet piles, 10 in. by 20 in. in section, reinforced by ⅞-in. bars and woven wire, and weighing 4.2 tons. The first sheet pile was sunk under water pressure of 175 lb. per sq. in. to a penetration of 36 ft. in 1½ min. The water pressure was turned off and this pile remained stationery in its position during the sinking of the second pile. The time required in sinking the second pile was 4 min., the same water pressure being applied.

The second test was the sinking of a 45-ft. foundation pile, 16 in. by 16 in., weighing 5.7 tons, supported by an inclined scaffolding at an angle of 12½ deg. from the vertical. This pile made a penetration of 43 ft. in four minutes and maintained the same degree of inclination as the scaffolding.



Interested Spectators Witnessed the Demonstration

The third test was the sinking of a pile of the same dimensions perpendicularly to a depth of 84 ft. in nine minutes under a pressure of 250 lb. Each of the piles was withdrawn under somewhat reduced water pressure for use elsewhere, with the exception of one of the 45-ft. by 16-in. by 16-in. piles which was sunk nearly its entire length and upon which a heavy weight was placed as a test of its supporting strength.

The fourth test was that of placing a pile 20 ft. by 14 in. by 14 in. which is the standard size of the anchor piling used in the river protection work along navigable streams. The weight of this pile is 2¼ tons. It was sunk to a depth of 70 ft. in six minutes under 250 lb. water pressure.

THE NEW YORK, ONTARIO & WESTERN announces that its locomotive shops will be operated with full forces beginning June 5. Since early in April, large numbers of men have been laid off because of the light freight traffic following the strike of the coal miners.

"The Commission Declares Its Independence"

THIS IS THE title of a circular to members, issued by the Railway Business Association on May 24, and signed by A. B. Johnson, president, which reads in part as follows:

Railway managers are justified in feeling and we understand do feel that the compromise announced by the Interstate Commerce Commission on May 24 warrants hopeful confidence and a steady enlargement of purchases for maintenance and additions. By dating the reduction in freight rates July 1, the date when the Labor Board decision is generally expected, the commission has employed perhaps the only expedient properly available to it for practically synchronizing the rate and wage adjustments. This will inspire railway managers with confidence in continued improvement of income. We have urged that the commission should in some way make clear that the rate level to go into effect July 1 is intended to be stable for a considerable period.

Attention on the Labor Board

Attention will now be focused upon the Labor Board. Whether that Board is to enjoy favorable public opinion will depend upon the degree to which it co-ordinates its forthcoming action with that of the commission.

By clipping off ¼ per cent from the rate of the return at which its regulation will be aimed the commission makes a concession which may be accepted as responsive by those who have urged that 6 per cent was too much. Time must test this adjustment.

By making the decision horizontal the commission gives its answer to those who through political pressure have attempted to obtain reductions on selected commodities. The victorious horizontalists were represented by the National Industrial Traffic League, which rigidly restricted its efforts to testimony presented in an orderly manner before the commission and deprecated the enlistment of political leaders for exertion of influence. There are impartial economists who favor a permanent policy under which certain grades of commodities would be carried at lower rates than has been the American tradition and certain other grades at rates higher than our usage. By initiating its own reductions in its own way the commission has asserted its independence and thereby given the country new reason for holding it in respect. Appeal to the railroads from the commission's judgment not only is repugnant to the law but portends destruction of the commission as a quasi-judicial body. There is no middle ground. Either the task of restoring railway credit as a basis for railway rehabilitation is the task of the Interstate Commerce Commission or it is not. If it is, then every attempt to evade acquiescence in the judgments of the commission is a repudiation of judicial process and a proclamation of private warfare in the settlement of disputes.

We have no means of verifying current reports imputing to candidates for re-election an effort to make railway rate reductions a claim for consideration at the polls. We would prefer to discredit them. If, however, there are even a few candidates who have a confused idea of what ought to win the approval of constituencies we counsel them to draw wisdom from this latest refusal of the commission and the railroads to surrender their independence of judgment. The best advice to give candidates for office from now until November is that they give the railroads, the industries, the farmers and the commission an opportunity to work out the rehabilitation of the transportation machine upon which depends upon prosperity and preparedness for future traffic.

Proceedings of the Fuel Association

Later Sessions Dealt with the Relations of the Railroads to the Coal Mining Industry

DURING the later part of the fourteenth annual convention of the International Railway Fuel Association, which was held at the Auditorium Hotel, Chicago, May 22 to 25 inclusive, a number of papers and addresses were presented which dealt with the coal mining industry in its various relations to the railroads and the public. The earlier part of the program, which dealt more directly with the problems of the railroads with respect to the economical use of fuel, was presented in last week's issue of the *Railway Age*, page 1233.

Status of the Coal Mining Industry

Addresses discussing the present status and future prospects of the bituminous coal mining industry were delivered during the convention by F. S. Peabody, chairman of the board, Peabody Coal Company, and by T. H. Watkins, president, Pennsylvania Coal and Coke Corporation. Mr. Peabody discussed the subject of idle day cost and Mr. Watkins dealt with the relations of the government with the coal industry. In a paper on the over-development of the industry to transportation, C. E. Lesher, editor of the Coal Age, pointed out that the over-development has not been without its benefits to the consumer because of the effect on selling price of the desperate competition thereby effected.

Mr. Peabody's Address

Mr. Peabody, using the operations of his own company as a basis, estimated the capacity of the bituminous mines actually developed in the United States, working 300 days a year, to be 1,000,000,000 tons a year. The total investment in the bituminous mining industry, on the same basis, was estimated to be approximately $2,000,000,000 with about 700,000 men employed in the industry. The average output of the bituminous mines runs between 450,000,000 and 500,000,000, the mines working approximately 200 working days, leaving 100 working days idle. The annual loss on the capital because of the 100 idle days amounts in the aggregate to $123,912,000. This total is made up of $40,000,000 interest, $51,968,000 for labor and supplies required in the maintenance of the mines during the idle days, a depreciation charge of $26,666,000 and taxes and insurance amounting to $5,278,000. The depreciation is charged on a basis of an average life of the mining property of 25 years before exhaustion.

Mr. Peabody estimated the average wage of mine employees, including all classes of labor, at $4.00 a day. For 700,000 employees this amounts to a total annual loss of $280,000,000 for the 100 idle days, an economic loss which could have been saved if the surplus labor represented by the idle time had been employed in other productive work.

Mr. Peabody expressed the opinion that neither the repeal of the Sherman anti-trust law or government control of the industry would prove to be the solution of its present difficulty, but advocated unrestricted competition as the best means of ultimately restoring the industry to its proper relation to the public demand. This would result in the elimination, through bankruptcy, of excess mines and a gradual discharge and redistribution of the excess labor. Mr. Peabody expressed the opinion that ten years will be required to bring about such a readjustment but that in the long run this is the cheapest way out of the situation from the public standpoint.

Mr. Watkins' Address

An abstract of Mr. Watkins' address follows:

I fully agree with the statement made by our former Fuel Administrator, Dr. Harry A. Garfield, that "when basic necessities are involved, government, representing and speaking for the entire public, must charge itself with responsibility to see that capital does not impose upon labor, nor labor upon capital, nor either or both of them upon the public."

Today our laws restrict and prohibit certain activities of capital; trade agreements are not yet clearly defined. On the other hand, labor associations have by statute been made exempt from anti-trust laws. The responsibility of labor organizations has not been defined. Organized labor has by statute been made a privileged class. This great crisis may bring the people of the nation to a realization that labor organizations, together with capital, must be bound by proper and reasonable restraints.

Too often has it been the case in the past that orders for railroad coal are placed where five or ten cents a ton difference in the price has been the controlling factor in shifting hundreds of thousands of tons from one mine to another, or worse, from one district to another. Too often has the temptation of a guaranteed car supply offered to certain operators resulted in breaking the whole market structure.

You might quite easily say, that the purchasing agent's duties are to buy his coal as cheaply as possible. But how seldom the purchasing agent or the superintendent of motive power, who may have the decision, considers in the shifting of his orders the effect that it has on the working men and the communities dependent upon those particular mining operations. The tonnage consumed by our railroads is of such magnitude that displacement of any considerable amount from district to district, year by year, contributes enormously to the unrest and discontent with earnings and working conditions in the coal mines.

Railroads in many instances, owing to the desirable character of the traffic, have encouraged the development of new fields in advance of the market's normal requirements. The result of over-development and supply in excess of the market requirements has been costly, causing many wasteful practices in the mining, distribution and selling methods. Intermittent operation at the mines increases costs enormously, also making it extremely difficult to handle the mine labor problem satisfactorily either to the operator or the miner.

From the standpoint of production there is no other industry, taking the country as a whole, wherein the production is as uniform as between summer and winter seasons as in the coal industry. Anthracite is practically uniform throughout the year, very little fluctuation in the production having occurred for many years. Bituminous shows that the production in the so-called summer months, running from April first to October first, has not fallen below 45 per cent of the total annual production for nine years. There were local districts where these percentages did not apply. It would be impracticable to try to improve to any

great extent on the present situation as far as production and demand as a whole are concerned.

What is needed above all else in order to stabilize production and demand is a method of handling our labor problems both on the railroad and at the mine by which strikes or threatened strikes will be avoided. Then, within the industry stabilization will come about naturally without risking dangerous experiments.

The enormous amount of intermittency of employment which has existed for the past year has been due to the fact that through the award of the Bituminous Coal Commission the union operators of the country were forced into a contract, binding upon them up to the first of April, which compelled them to pay a rate of wages from 30 to 40 per cent in excess of the wages of non-union operators, which naturally resulted in the displacement of great volumes of tonnage from one district to another union operators and miners losing tonnage to their competitors, whole communities thrown out of gear, railroad facilities idle, while in other sections the opening of new mines, increasing the capacity of old mines, was rapidly proceeding.

The union operators subject to the competition referred to would fail in their duty to their own interests, to the public interests, and to their employees if they should agree to repeat the mistakes of the past, or to abide by arbitration that did not settle a wage basis for their competitors as well as for themselves. I do not see how this fact can be ignored. The union leaders do not ignore it; they are waging a battle to control the non-union fields of the United States; they seek domination of the whole industry. Whether they can secure it or not remains to be seen. If they do, what then will be the policy of this government? Will that aggregation of labor be left free under the present liberal construction of labor's rights to tell the country how it is going to secure its coal, at what price and when?

In the fixing of wages a general principle should be admitted. The wages in any industry must bear some fair relation to the wages in related industries. It would inevitably follow that a material departure from this standard in the way of high wages for any particular class results in attracting to that industry a surplus of labor, finally resulting in short time employment or lower earnings. In other words, the law of supply and demand is inexorable, and follows into the wage structure as it does into the price of commodities.

I can think of no other solution, as applied to basic industries, than one that is based upon fair wage standards of related industries with a minimum wage that takes into consideration the cost of living and the nature of employment. Neither the government, nor any other agency of inquiry, investigation or arbitration, would be able to build up a wage structure satisfactory to the miner, operator or the public. The only way to a solution lies between miner and operator on the principle of collective bargaining, bearing in mind at all times the economic and competitive situation surrounding the industry. From these general principles the union organization has departed. Operators generally have not believed that the industry can be controlled in a practical manner by any national policy. So that the practical solution is the return to district agreements. The laws now on our statute books leave that method as the only practical procedure.

Mr. Lesher's Address

After citing statistics to show that the coal mining industry is over-developed, Mr. Lesher stated that the public interest in this fact centers largely around its effect on labor in the reduced opportunity of the individual to work and the high unit wage required thereby to insure a sufficient annual income. He called attention, however, to the effect of the excess of mines as a safeguard to the consumer of soft coal against high prices, stating that few bituminous coal mines have reached the happy state of a steady profit year in and year out. To demonstrate that the charge carrying the excess capital invested in coal mines is not a direct tax on the consumer, Mr. Lesher referred to a recent statement of T. T. Brewster, an Illinois coal operator, in which he estimated that the price of the coal at the mine should be $1 over the combined labor and material cost in order to take care of capital charges. Since the $1 was calculated on the basis of an annual output of 500,000,000 tons and the production in 1921 was but 407,000,000 tons, the $1 actually becomes $1.23 a ton. This was actually 55 cents more than was received in the average selling price of $3.04. In other words, the consumer of coal in 1921 saved nearly a quarter of a billion dollars because of the competition in the bituminous coal industry, resulting from its over-development.

Mr. Lesher then sketched the relation of the railroads to the development of coal mines, showing that the desire for traffic has led railroads to build branch lines into all districts carrying coal deposits, as a deliberate policy, partly to develop traffic for immediate handling and partly to protect the individual interests of the railroads in future mining developments. The availability of the transportation, however, encouraged over-development in the mining industry. Continuing, Mr. Lesher said: "Because the soft coal mines out at the ends of the feeders can load more coal than these feeders can carry and because these feeders can carry more coal than the main line, assembling yards, junction points, and terminals can handle, a car shortage arises when all the mines try to run full time. Cars are portioned out in accordance with capacity of the mines. It, therefore, happens that an operator who desires to be assured of a given output per day every day, say 1,000 tons, must build a mine with a capacity of 2,000 tons per day. The rules of car distribution during periods when cars are short, and those of the times when everyone is calling for coal, force over-development.

"There is one way to avoid such over-capacity and yet get coal to market in times of tight car supply. That way is to own cars. Privately owned cars are not subject to the rules of distribution affecting the cars of the railroad, unless they are what are known as assigned cars. Thus the coal operator who would be assured of always putting a given minimum of coal to market each day or week must either double his mining capacity or own a string of open top cars. His extra investment is about the same in either event."

Mr. Lesher then discussed the possibility of effecting a cure for the evils of over-development in the industry and dismissed the proposal that this be done in a reduction of the number of men employed in the mines as impracticable because of the fact that it would still leave the burden of excessive capitalization on the industry. He then took up the suggestion that the improvement be effected by the elimination of mines, that is, of capital investment, and stated that the specific development to be selected for elimination may be determined by one of two methods, either the arbitrary action of a super-authority appointed by the government or the process of natural law. There is a choice of two criteria in carrying out the arbitrary method of elimination. One is to select the newest mines and the newest fields, because these are the units of production that have been superimposed on the industry. But these are the most profitable units, with the lowest operating costs and their elimination would, therefore, raise the average cost of production of bituminous coal by 25 per cent. The other method is the selection of the mines with the shortest running time for elimination. This would leave the more economic fields in operation but obviously would meet with much opposition from the industry itself, if its accomplishment were attempted by arbitrary methods.

Taking up the process of natural law, Mr. Lesher said: "The Transportation Act of 1920 has already provided for calling a halt to indiscriminate encouragement of coal

field development. We appear to have passed that hazard. One with half an eye and any belief in the future growth of this country must see that the over-development of today in this basic industry may become the under-development of the next decade. That is exactly what happened to the railroads, to our national sorrow. I believe the growing pains of the industry are about over, that it is entering the period of sturdy young manhood. It will shortly be decided whether it is to reach maturity under the tutelage of government or under the guidance of private initiative and enterprise. The United Mine Workers and the operators are now striving for the control of the industry. The union will never be permitted to secure that control directly. The operators would much prefer that the government have their mines. . . . .

"This over-development is not an unmitigated evil. I hope we never remove it completely, for that would be poor national policy. We trust that it is halted now, for the rate of growth of the past five years was leading in the wrong direction. It would, however, be good public policy to introduce measures designed steadily to reduce it. These measures will be feasible and sane only when they look to make operation unprofitable for some mines and thereby put them out of the running and provide for keeping them out of the running during boom periods."

The Relation of the Maintenance of Way Department to Fuel Conservation

By W. S. Burnett

Engineer, Maintenance of Way, Cleveland, Chicago, Cincinnati & St. Louis

On the Big Four, the maintenance of way department handles the coaling stations. There is not much opportunity at these stations to conserve coal, unless it be to watch the loading of engine tanks, to see that these are not overloaded, that coal spilled at the dock is kept picked up and all coal is cleaned out of the cars. If the dock is operated by steam, careful firing of the boiler is required to avoid extravagant fuel consumption. The fuel compartment of the dock should be cleaned regularly, so as to avoid accumulation of fine coal and consequent waste if this fine coal is loaded to engine tanks; also to avoid loss by spontaneous combustion if the coal should take fire in the dock.

Coal dock attendants should keep a sufficient supply of coal in the dock so that the breakage of coal will be reduced to a minimum. If the coal is permitted to fall from a considerable height it will break up and locomotives will be furnished too large a proportion of fine coal. This has been the cause of numerous complaints from enginemen. By keeping the docks nearly full there is less likelihood of the lumps rolling away from the fine coal and causing a decrease in value of the fuel when used on engines.

Neither the locomotive engineer nor the fireman can be held responsible for all of the coal consumed on the engines while they are on duty, because of the indirect responsibility of officials and other employees. The maintenance of way department carries a lot of this responsibility and I will mention a few instances where it can greatly aid in the conservation of fuel.

The work in connection with maintenance of tracks and bridges in many instances requires slow orders for the safety of trains. These slow orders mean greater fuel consumption, more especially if the speed is restricted below 30 miles per hour. The laying of new rails and the reballasting of the tracks mean reduced speed. The program of the work should be carefully considered, so as to prevent the stopping or slowing up of trains. In laying rail this can be partly avoided where there is double track by using single track during the hours the work is in progress. On single track the best time between trains should be selected so that a considerable stretch of track can be laid in a short time and full spiking and bolting carried on under traffic. While reballasting tracks care should be taken not to strip too far ahead of the gravel supply so as to avoid skeleton track. The track should be in shape for the passage of all scheduled trains during work period, and if filled with ballast should be left in condition for full speed during the night.

Where slow orders are placed on bridges for the protection of workmen and not required for the safety of the structure, these orders should be maintained during working hours only.

Due to increased tonnage of trains the question of extending passing tracks is continually arising. When deciding on the question of extension of passing tracks, consideration should be given to the saving of fuel, as the doubling over of a few trains greatly increases operating expenses.

Industrial tracks should be planned to consume the smallest amount of time in switching, and this can be done by seeing that the grades are easy and curvature low. In placing yard tracks the grade should be laid so that the cars will require a minimum amount of power from engines. The location of the ground selected for yards is sometimes favorable to this, but if not, with a small additional expense for grading the cars can be made to run by gravity, at least for movement in one direction. The fuel saving here will be enormous and more than compensate for the extra cost of grading.

The failure to properly consider the arrangement of signals results in delays to or stopping of trains, more especially when interlocking plants are closely located and do not work in unison. It is, of course, apparent that the maintenance of interlocking plants should be followed up closely, renewals anticipated and every effort made to keep them in continuous service.

The operation of work trains under the jurisdiction of the maintenance of way department is another factor which materially affects fuel consumption. Representatives of the maintenance of way department in charge of work trains should keep in very close touch with the dispatcher so that they can efficiently conduct their work with the least possible delay to their own or to other trains. This is especially important when work is being done on track where the grade is heavy or in yards where several switch engines are working. The stopping of passenger or local freight trains to unload maintenance of way employees or maintenance of way material should be watched carefully and unnecessary stops avoided.

In addition to handing coal at coaling stations, the maintenance of way department also distributes coal for other facilities, such as water stations, power plants, etc. They also unload the coal for use at passenger and freight stations and for offices. Most of the coal consumed at these points comes from that picked up on the line, principally in yards where there is a large movement of coal. A large number of hopper cars are dumped in yards, either through rough handling or defective equipment. It is the duty of the maintenance of way men to pick up this coal. It should be reclaimed promptly and loaded free from dirt and cinders. In the event of an excess of this coal, it may be used for the coaling of locomotives and the inclusion of dirt and cinders will greatly reduce its economical use. Lumps of coal falling from engine tanks or cars should be picked up currently and free from dirt.

At maintenance of way steam plants, boilers should be assigned to the best advantage for the work to be performed.

These boilers should have regular inspection and be kept free from leaks and other fuel wasting items. The grates, dampers, flues, etc., should be given special attention so that the most economical service can be maintained. Maintenance of way employees should be instructed to report to their superiors any condition which may come under their observation, which to the best of their opinion will result in a saving of fuel.

Report of Committee on Storage Coal

Although a large amount of coal has been stored during the year by many industries and by the railroads, particularly during the latter part of 1921 and the early part of 1922, owing to the expected suspension at the coal mines, there are few significant developments to report since the last report of the committee was made in May, 1921, in regard to new methods or appliances for storing coal.

W. L. Robinson reported to the committee regarding the storage of coal on the Baltimore & Ohio railroad for 1921 that a program covering the storage of 180,000 tons of ¾-in. carefully selected lump high volatile steam coal was worked out. The coal was from selected mines operating the Pittsburgh Seam in the Fairmount and Ohio No. 8 field. Typical proximate analysis as follows:

Moisture	0.80
Volatile	40.50
Fixed Carbon	52.50
Ash	6.20
Sulphur	2.50

The method of unloading into storage by dropping the doors of hopper cars, dragging out the coal and lifting track on the coal was adopted on account of the relatively low cost of this method.

The detailed instructions as to storage coal were as follows:

The pile should not be over 15 ft. in height, the base to be approximately 60 ft., the leveled off portion on top of pile to be 15 ft. With these sectional measurements, the pile will run about 14 tons per lineal foot.

If more than one pile is made, a distance of 20 ft. is to be maintained between piles for purposes of installing track for reloading.

As soon as pile is completed, the track will be moved from the top of pile to the surface level and parallel with the storage pile, thus making provision for quick removal of any portion of pile that might fire, by use of standard railroad non-revolving steam shovel, American type railroad ditcher, or locomotive crane for reloading the coal, either in case of emergency, heating or for current use.

The reloading track should be maintained, readily accessible for prompt use in event of spontaneous firing, and the shovel, crane or ditcher kept readily accessible and in condition to be used.

The storage was made at six locations remote from the mines, the work was let on contract and supervised by the local superintendents, the initial placing of unloading tracks having been done by company forces and the subsequent track raising by contractor's forces. Unloading of coal was started on September 7 and completed on December 29. A total of 190,000 tons was stored, the largest single storage being 50,000 tons.

The cost of unloading, including contract labor and supervision, work train service and coal used, crane service and coal used and excluding initial cost of track which was of used material, averaged 13.1 cents per ton.

President Harding recognized the importance of the storage of coal as a stabilizing agent in his message to the American Mining Congress when he said: "Is there no way of regulating the demand so as to distribute it more uniformly over the 12 months? Is it not possible to provide storage reservoirs which will enable the large consumers and large producers to accommodate their conditions to a need of a more continuous rate of production?"

In commenting on this suggestion of the President, Doctor H. Foster Bain, Director of the United States Bureau of Mines, said in part: "The adoption of a general policy which will provide reservoirs of bituminous coal to be drawn upon in times of great demand or of low production is entirely a commercial question. A lower seasonable price could be brought about by concessions on the part of the miner, the mine operator and the railroads. Steady and regular mine operation at capacity production means lower cost as compared with intermittent operation and lessened production."

Under date of January 5, 1922, Mr. James M. Kinkead, division engineer, Trenton Division, Pennsylvania Railroad, reported the storage of approximately 81,000 tons of coal at Runyon, near South Amboy, N. J., which was received from mines in Cambria County, Pa., and is known as the Miller vein. The chemical analysis is as follows:

	No. 1	No. 4
Moisture	.53	.41
Volatile matter	21.09	17.94
Fixed carbon	72.49	77.12
Ash	5.89	4.53
Sulphur ....per cent	.82	.69
British thermal units	14766	15085
Sesquioxide of iron in ash	3.82	3.61
Softening point of ash....above	2,600 deg. F.	2,600 deg. F.

The storage was started on October 3, 1921, in three piles averaging 13 ft. in height by 35 ft. to 40 ft. width at the base and was unloaded by dropping the car doors and jacking up the track. The coal was very slack and one of the piles ran a temperature of 150 deg. F. for a length of 600 ft. out of a total length of 3,200 ft. The heated coal was turned with a steam shovel.

An interesting example of under-water storage, under practically unfavorable climatic condition, was that in connection with the storage plants of the United States Government at Balboa and Cristobal, in the Canal Zone. These plants were illustrated and described in detail in Bulletin 116, Engineer Experiment Station, University of Illinois, page 122. It is interesting to note that after using both ground storage and under-water storage, under the conditions prevailing in the Canal Zone, the United States Government has felt justified in giving up the under-water storage, and while no direct statement has been made, this would seem to indicate that the government considers that ground storage is safe.

One of the mining companies in central Illinois reported to the chairman of the committee during the year that upon shipping to a customer a car of coal that had been in storage under water, the customer reported back that the coal burned faster than the freshly mined coal. The coal was removed from the water pit by a centrifugal pump and the mining company has reported that the small bits of pyrites and fire clay seem to have been separated from the coal and to have gone to the bottom of the pit, thus making the reclaimed coal really purer than that which was stored.

Stocks of Coal Held by Railroads

According to statistical reports of the United States Geological Survey the stocks of coal held by the railroads for several years past and at various times since the last report of the committee were as follows:

Date	Tons
January 1, 1919	11,742,847*
March 1, 1920	3,520,385
June 1, 1920	2,898,057
January 1, 1921	7,542,247
April 1, 1921	7,540,380
November 1, 1921	8,958,389
January 1, 1922	13,000,000
March 1, 1922	14,850,000**

*Taken from U. S. Geological Survey Bulletin dated November 1, 1921. A Bulletin of the U. S. Geological Survey dated January 1, 1922, gave the amount in storage January 1, 1919, as 13,644,000 tons.

**Under date of March 1, 1922, the U. S. Geological Survey Bulletin said:

"The American Railway Association has courteously supplied information

as to the quantity of coal held by the carriers on March 1 for railroad fuel and all other railroad use. The roads already heard from had a total of 14,850,000 tons, and it is expected that complete reports will show over 16,000,000 tons. As the largest stocks of record in the past are 13,640,000 tons on January 1, 1919, it will be seen that the railroads have accumulated what is for them an enormous reserve of coal. It is sufficient to last on the average of 42 days at the present rate of consumption. The stocks on the day of the armistice were sufficient for only 31 days, part of the difference being the greater requirements of the roads at that time."

Under date of April, 1922, the monthly supplement of the Commerce Reports gave the amount of coal in storage by railroads as 22 per cent greater than on January 1, 1919.

Coal Storage Literature During the Year

In the Factory for April 15, 1921, after the last report of the committee had been printed, W. L. Abbott, chief operating engineer, Commonwealth Edison Company, had a very interesting article upon general principles of coal storage and the appliances used. Mr. Abbott has been one of the foremost advocates of coal storage, and under his direction the Commonwealth Edison Company of Chicago has successfully stored hundreds of thousands of tons for a number of years past. Mr. Abbott concludes his article as follows:

Coal may also be stored so that it surely will take fire—notice I say, will—if kept in storage during a few months of warm weather. The way to obtain this generally undesirable result is to select for the purpose mine-run coal which will ordinarily contain about 20 per cent of fine coal which would go through a ½-in. screen. Handle this coal into storage with a crane. Drop each successive bucket of coal on the top of the pile already formed, for by doing so, the fine coal will remain in the center and the coarse coal will roll down to the edge of the pile. When your pile is complete, you will have coarse coal around the edges and the lower slope of the pile; in the center of the pile all the way from the top to the bottom will be most of fine coal; there will also be a zone about half way up the side of the slope where the coarse and the fine coal are mixed. In the central section of the pile, the mixture is so well proportioned and so densely packed that air cannot circulate to support combustion. Along the outer edge and the lower slope the coal is too coarse to heat, but about the middle of the slope or higher up the voids between the coarse coal are partially filled with fine coal and through the remaining portion of the voids air can circulate just freely enough to support the slow oxidizing which is going on, and not too freely to carry off the heat. It is along in this zone at a depth of from five to eight feet, that the greatest heating occurs.

Mr. Abbott's specifications for storing coal so that it will surely take fire are pertinent because they represent the practice of too many railroads.

Bulletin No. 128, Engineering Experiment Station of the University of Illinois, by Ray W. Arms, entitled "The Ignition Temperature of Coal," is an important contribution to the subject of spontaneous combustion. At the present time an investigation is in progress under the direction of F. R. Wadleigh, chief of the Fuel Division, Bureau of Foreign and Domestic Commerce, Washington, D. C., in regard to the operating and maintenance costs of coal storage. No definite statement has yet been made as to just what will be included in this investigation.

The report is signed by H. H. Stoek, chairman (University of Illinois); A. H. Davies (Belmont Coal Co.); C. G. Hall (Walter Bledsoe & Co.); O. H. Hertel (Old Ben Coal Corporation); O. P. Hood; J. B. Hutchison (Pennsylvania System); W. J. Overmire (Big Four); B. P. Phillippe (Pennsylvania System); R. E. Rightmire (Consolidation Coal Co.); A. P. Wells (Central of Georgia); H. Woods (Colorado & Southern), and S. L. Yerkes (Grider Coal Sales Agency, Inc.).

Discussion

The discussion brought out a number of instances where coal in storage piles built up according to the best known principles, had fired and when the same coal stored under much more adverse conditions had not fired. In closing the discussion Professor Stoek made no attempt to explain these instances, saying that the best that the committee could do was to gather all available information concerning the circumstances surrounding as many storage piles as possible, and recommend as safe practices those which in the majority of cases have met with success. Two conditions were most stressed by the members taking part in the discussion as being of the greatest benefit in preventing spontaneous combustion. These are the avoidance of wet coal in the piles or the location of the pile on wet ground and avoiding as far as possible the mixing of different coals in the same piles. Coal high in sulphur and ash was considered most undesirable for storage purposes, especially if piled in wet weather.

Educational Work for Fuel Economy

By D. C. Buell
Director, Railway Educational Bureau

Education on a railroad is so intimately bound up with supervision that the two are almost synonymous. One of the present indications of the realization of the importance of educational work is the endeavor being made on many railroads to relieve their supervising officers of office work and keep them out on the road mingling with the men as much as possible. In the past few years the greatest advance in educational work on our American railroads has been due to the practice, which has become almost universal, of holding frequent staff meetings at which matters of vital importance to the operation of the property are discussed by the officers and the men together. These staff meetings started first as an outgrowth of the safety movement and later developed into general meetings with splendid results.

In spite of the universal mental unrest of officers and men of our railroads during and following the period of federal control, there has been a willingness on the part of railroad men to take advantage of educational opportunities of a practical nature which have been presented. This willingness is growing month by month and the prediction is made that during the next ten years railroad men will not be willing just to get by with their job, but will welcome and take advantage of any practical opportunities offered them to increase their knowledge and become more proficient in their work.

From the very nature of the case the greatest economy in the use of fuel on railroads is directly in the hands of the locomotive fireman. In the old days, a man was not allowed to fire a locomotive until he had served his apprenticeship in the roundhouse or on the ash pit, or in some capacity where he became somewhat familiar with firing practice, but the present method is merely to hire the most likely looking man applying and put him right to work as a fireman without previous training or experience other than a couple of road trips for the purpose of breaking him in to his new work.

It is believed that the growing realization of the importance of educational work on our railroads will result in certain definite methods of procedure in the not too distant future, as follows:

The establishment at large railroad centers of schools for the training of new firemen. At these schools, men selected for the position of fireman will be given thorough instruction on fuel and its use. Dummy fire boxes will be set up where men can be given actual practice in shoveling coal and be taught the proper handling of a scoop, and the proper plac-

ing of coal in the fire box. At these schools men also will be taught the principles of various types of stokers and stoker operation, as well as the flagging rules, the giving and interpreting of hand, lamp, and other signal indications, the principles of the injector, etc. A week or ten days' intensive instruction along these lines will mean much during the following years that the applicant holds the position of locomotive fireman.

Supervising officers will be relieved more and more of clerical work, attendance at meetings, and other duties which reduce the amount of time they spend on the work with the men in actual supervisional and instructional work.

Moving pictures will be used to a much greater extent than at present and with regularity to instruct men in fuel economy as well as in the other phases of railroading that they must learn as they progress as firemen. These moving pictures will interest and improve the service of older firemen and engineers.

Supervising officers will encourage their men to take advantage of other educational opportunities which may be offered from time to time and will work with the men to help them take advantage of such educational opportunities.

There is a possibility that, as this educational problem assumes more importance, the railroads will select from among their employees those who are best informed to act as instructors and will perhaps find it economical when the right kind of man is available to use such a man as an instructor on the division on which he is employed.

Discussion

In presenting his paper Mr. Buell said that about ten per cent of the men in railroad service are studying to better themselves through personal ambition, while 90 per cent must be induced to study by some outside means. This necessary inducement can be brought into effect by the local fuel organization, by some form of bonus, by competition through the natural satisfaction which all individuals feel in the knowledge of a good job well done and by progressive examination. He expressed the opinion that compulsory educational work is not likely to be highly successful.

That the most difficult task is not that of educating the men, but educating the higher officers to the requirements of fuel economy, was expressed by a number of those who took part in the discussion. This was illustrated by the experience of the Southern Pacific in its campaign for fuel economy in stationary plants. For a year or two emphasis was laid on the education of the men operating the plants, but with very meagre results. The matter was then taken up with the division superintendents, the performance of the plants on each division being rated competitively, with the result that last year the co-operation of the superintendents was obtained and a marked improvement effected.

Report on Fuel Accounting

The committee concurred in the recommendation of the Purchases and Stores Division of the American Railway Association that locomotive fuel be accounted for by individual locomotives, both as to quantity and value chargeable to each account by divisions, main and branch line districts, freight and passenger service and by states, for yard switching service; also, a charge for quantity and value by accounts for all fuel used for miscellaneous purposes, and submitted the following conclusions on the three points carried over from the 1921 meeting:

1. Other than locomotive fuel; 2, coal picked up in yards and on right of way, and 3, coal removed from overloaded commercial cars.

1. Fuel used for all purposes other than locomotive operation, such as stations, elevators, power plants, etc., should be charged out to the facility and in the month in which it is used. Fuel ticket and department invoice, properly receipted, should be required to cover the issue.

2. Coal picked up in yards and on right of way and fuel oil reclaimed in sump should be charged to the service in which it is used and locomotive fuel account credited, as it is the clearing house for all such over and under charges.

The labor cost of recovering such fuel should be charged as follows:

(a) "Roadway Maintenance" ("General Cleaning") if outside of shop yards and used for other than locomotive operation, or recovered in hump or classification yards.

(b) "Shop Expenses" if within shop yards and used for other than locomotive purposes.

(c) "Fuel Station Operation" if such fuel, after being recovered, is used on locomotives.

3. The overload removed from commercial cars may be used by the company for its own operations, and payment made to the shipper for the actual amount of coal removed at a price agreed upon, with deduction covering cost of labor, switching and reweighing. Where car is returned to mine from scale for lightening by the shipper a switching charge should be assessed.

The report was signed by J. N. Clark, chairman (Sou. Pac.); C. N. Beverly (B. & O.), E. E. Chapman (A. T. & S. F.), R. R. Hibben (M. K. & T.), R. E. Jones (D. & I. R.), Joseph McCabe (N. Y., N. H. & H.), Hugh McVeagh (Big Four), C. F. Needham (Grand Trunk), and W. J. Tapp (D. & R. G. W.).

Report on Firing Practice

Mechanical firing on locomotives, like hand-firing, is subject to careless and extravagant practices. Correct supervision is as necessary here as in hand-firing. The successful and economical performance of a stoker depends, first, upon the proper condition of its parts, and, second, on proper operation (granting, of course, that the locomotive may be in proper condition). The things that constitute proper firebox conditions on hand-fired locomotives similarly apply to stoker-fired locomotives.

It should be understood that a mechanical stoker is in no sense automatic.

For economy in firing locomotives which are equipped with mechanical stokers, the committee recommends the following practices:

Before a fire is built in a locomotive, the distributing features of the stoker should be inspected and known to be in proper condition. The fire should be free from clinkers and banks when the locomotive is delivered to the engine crew.

The stoker should not be used in building up the fire, either by roundhouse force or engine crew. Build up the fire by using the hand shovel. Commence the operation of the stoker as soon after starting the train as conditions require.

The fire should be maintained with the hand shovel when standing, drifting or doing short switching.

Use shovel to build up spots in the firebed which may be thin or undersupplied by the stoker. In that way maintain a uniform distribution of coal over entire grate surface. Every square foot of burning surface requires coal.

Because of the thinness of the fire on stoker-fired locomotives greater care should be exercised when shaking the grates than is required on hand-fired locomotives. If practical, grates should be shaken only when the locomotive is not using steam.

Attention should be given coal as it feeds into conveyor; removing any foreign material which would tend to clog or interfere with the operation of the stoker.

Frequently observe the condition of the fire to know that it is properly maintained. Best results are obtained by continuous stoker operation, care being taken not to crowd the fire.

See that the locomotive, the fire and the firing apparatus are properly adjusted to produce the minimum amount of smoke.

When approaching grades the fire should be properly prepared, to meet the heavier demands. Do not wait until the train is on the grade before speeding up the stoker.

Before beginning a descending grade or before taking on coal the conveyor slides should be closed.

In case the stoker stops, due to clogging by foreign matter, the stoker throttle should be closed before any attempt is made to remove the obstruction. The fire should be maintained by hand until opportunity presents itself to remove the obstruction.

When approaching terminal, have all slide plates closed. This should be done at a sufficient distance so that without waste all coal may be worked out of conveyors. The engine crew should close all valves of stoker apparatus before leaving the locomotive.

To supervising officers who give attention to fuel, firing practice will always consist of two distinct things: first, the methods themselves for securing practical economy, and, second, the maintenance of those methods in practice. Proper methods are at hand. To develop in every-day routine the habitual use of those proper methods is the unending work of supervising officers.

Habitual clinkers and "banks" in a locomotive fire at terminals usually indicate improper firing, or improper engine handling if no mechanical defects exist. A supervising officer may select one of these extreme cases and proceed to improve the performance. A fair improvement, if permanently effected, could easily save five per cent in coal consumption. Now, since a freight crew burns approximately $15,000 to $20,000 worth of coal a year, the five per cent improvement would amount to $750 or more per case improved. If a supervisor did nothing else but improve five habitual "bankers," this alone would save $3,750, a sum which would go some distance toward paying his salary. But, who would work on only five cases a year? This illustration shows that lack of supervision means waste while well directed supervision means saving.

But it is not only the fireman who sometimes relaxes. Let us consider the engineer. Since the stoker is inanimate, an engineer may become indifferent, and perhaps his fireman too, though he may smile at his escape from a firing abuse that is now borne by a machine instead of by his back. With a locomotive equipped with a mechanical stoker the engineer may not now be able to overburden his fireman, but he is still able to "punish" the engine and the coal pile. Supervision can correct these faults.

The report is signed by M. A. Daly, chairman (Nor. Pac.); D. C. Buell (Railway Educational Bureau); M. Cavanaugh (C. St. P. M. & O.); B. F. Crolley (B. & O.); Chas. P. Dampman (P. & R.); J. W. Dodge (I. C.); J. C. Harris (Sou. Pac. Lines); L. R. Pyle (Locomotive Firebox Co.); F. P. Roesch (Standard Stoker Co.); A. N. Willsie (Locomotive Stoker Co.), and James Wilson.

Indirect Losses From the Use of Poor Quality Coal

By Earl Cobb

President, Southwestern Coal Company

In advocating the selection of coal of the most suitable quality for a specific purpose, Mr. Cobb stated that neither the policy of buying on price or on heating value alone, was likely to produce the lowest fuel costs per unit of service. He called attention to the fact that two coals with the same heating value might differ widely in the moisture content, the per cent of volatile and in the clinkering character of the ash. Mr. Cobb then illustrated the effect of these differences by assuming two coals, one with 11,500 B.t.u. and a combined ash and moisture content of 20 per cent, the other with a heating value of 13,500 B.t.u. and a combined ash and moisture content of ten per cent, the latter selling at $2.70 at the mine and the former at 40 cents a ton less, on an equated B.t.u. basis. This, he said, is a difference which is not uncommonly found in coals coming from the same district, especially in the Southwest. In this case the saving from the use of the higher quality coal is of two kinds, first, the direct dollars and cents saving and, second, the reduction in engine failures, delays and the possible effect on the length of locomotive runs resulting from the difference in the amount and clinkering character of the ash.

Assuming an average haul of about 200 miles on the home rails in each case, at six mills per ton-mile, the cost of the haul amounts to $1.20 a ton. The difference between 20 per cent and 10 per cent of combined moisture and ash content, therefore, effects a saving of 12 cents a ton in favor of the better quality of coal in the cost of movement on the home rails alone. Most western roads receive at least a part of their coal from off the lines at an approximate cost of $1.50 a ton in freight. Here then is an additional saving of 15 cents a ton in favor of the better quality of coal. To this must be added to the cost of handling the additional 10 per cent waste material through the coal chute to the locomotive tender and the loss of heat utilization due to the additional moisture content, to which, Mr. Cobb said, few railroads give the attention its magnitude deserves.

Taking up the indirect savings, and assuming the average cost of an engine failure as $200, it is evident that one engine failure due to the poorer quality coal would cost enough to pay the difference in price of 500 tons of the better quality coal.

The practice of many purchasing agents of buying coal on price rather than on a cost of service basis, Mr. Cobb said, is not an indictment of the purchasing agent but of the fuel supervisor and others who use the coal and understand the importance of service value, but fail to present their case to the purchasing agent in a sufficiently convincing manner.

Discussion

O. J. Brown (Boston & Maine) concurred in Mr. Cobb's presentation. He stated that the Boston & Maine had adopted a policy of buying coal on a quality basis with the result that during the year ending April 31, 1922, there had not been a single engine failure due to poor coal, whereas the coal failures during previous years had run from a minimum of 435 to a maximum of 1,380. Furthermore, there had been an increase of four locomotive miles per locomotive hour and a saving of $46,000 in the time of firemen cleaning fires on the road.

Incentives for Promoting Fuel Economy

By O. S. Beyer, Jr.
Consulting Engineer

If we simply consider as incentives those administrative devices which managements in the past have designed and applied in order to secure the interest and support of the engine crew in fuel saving, my task would be largely a descriptive one. But in my estimation such a consideration of the subject would be too narrow. It seems to me more important to get at the bottom of this question of incentives, and determine, if possible, what the motivating forces are which create an interest in and desire for fuel economy—or any other type of economy for that matter—on the part of railroad workers.

The first aspect encompasses individual fuel performance records, as applied to enginemen and locomotives, or the maintenance of individual efficiency records jointly with the usual discipline, health and reliability, or service records. This aspect would also include extra records in the form of individual bonuses or premiums for economical performances. Such special types of recognition as assigning a locomotive to an engineer and naming it for him, or painting the number plate red, or polishing up the cylinder head casings, are in this class too.

We recognize, on the other hand, as constituting the second aspect of incentives, the tendencies making for a community of interest in or mutuality of concern for better fuel performance on the part of the groups composing the human element of the railroad industry, namely, the workers, the supervision, and the investors. These tendencies come into being not so much by virtue of any special bit of administrative technique which management may devise, but rather by virtue of basic policies as established largely by the groups at interest. These are the result of deeper and more fundamental attitudes and actions. They arise automatically, spontaneously, i.e., as the interests concerned get together and lay the necessary foundations towards such ends.

The reception accorded most attempts to establish incentives when considered simply as devices for intriguing the individual engineman's interest in fuel economy has usually been characterized by apathy and indifference on the part of the rank and file. Some good has been done, nevertheless, by the utilization of these methods for stimulating economical fuel utilization, sometimes positive, but usually negative. The positive good which followed resulted from the added detail information furnished with regard to individual performance of the crew or locomotive in question. This detail information, when trustworthy, makes an appeal to his pride of craftsmanship, his instinctive desire to do well in his chosen work.

The negative good accomplished came from the revelations with reference to the absence of much needed data and means for securing it in order that genuine confidence and sound judgments might be developed with reference to the constituent elements concerned, namely, the locomotives and their operators. Among other things, the necessity for weighing devices at fueling stations was thus shown up. The result has been that some roads, at least, are now finding it worth while to introduce such devices as rapidly as circumstances will permit. In other words, the attempt to measure individual performance for the sake of securing a greater measure of co-operation from the rank and file in the direction of economies disclosed the fact that railroad managements were really operating in the dark owing to inadequate measuring facilities. They were not able to present evidence sufficiently detailed and accurate to convince any individual of the quality of his particular performance.

More important than all of this, however, is the revelation which has followed attempts to introduce incentive devices in respect to the limits within which good in the direction of improved fuel economy may be hoped for as a result of introducing them. And this in turn has emphasized the very profound interrelation which exists between the two aspects of the subject here considered. It is chiefly because basic conditions have been unsatisfactory that most of these "interest creating schemes" have been received with only a temporary show of concern, or, as more frequently happens, with conspicuous apathy.

What are the practical things which can be done, the next steps which might be taken, in order that incentive devices may yield worthwhile results? These steps consist in developing a greater community of interest between the management and the workers for the sake of their mutual benefit. This requires first the recognition that the railroad workers have as great an interest at stake in the welfare of steam transportation as those whose capital is invested in the industry, and second, by this token, that the workers are as greatly concerned as the investors in the economy and efficiency with which the railroads are operated.

Assuming that this basic conception is acknowledged and understood by those who supervise as well as those who disburse the fuel, how, then, are we to proceed in order to develop this potential will for improved fuel consumption? The answer is to recognize the workers' inherent right to a voice in the conduct of his industry consistent with the degree of responsibility he and his associates collectively are able to exercise in respect to the operation of the industry. This implies dealing with the workers—in our case, for instance, with the local district and regional organizations of the enginemen and firemen—in the interest of fuel economy as well as in the interest of wages, hours of work and working conditions.

However, this opportunity for co-operation is none too prevalent at the present moment. On most roads the managements barely tolerate the existence of only a few of the workers' organizations and are more or less openly hostile to the majority of them. The relationship which exists between management and those workers' organizations which are tolerated is furthermore chiefly concerned with what are usually known as "labor problems." Unfortunately the continual emphasis on this phase of railroad operation has quite successfully precluded a thorough and interested consideration of the possibility of developing a deeper concern for economical fuel utilization via the route herein considered.

It is not inconceivable that the chief prerequisite necessary to make possible the development of a genuine interest in incentive for better fuel performance, namely, stabilized wages, employment and working conditions consistent with American standards, may some day come into being. At least on such roads where this is accomplished the next step will be in order. And this step will be the co-operation of the workers and the supervision in the direction of betterments in fuel consumption. When this becomes possible then, and only then, will detail devices for promoting the individual interest of the engineer and the fireman in the efficient use of coal acquire real value and achieve lasting results.

Other Papers

The following reports and papers were also presented: Report of Standing Committee on Fuel Stations; Standard Form of Contract Covering Purchase of Railway Fuel, by W. J. Tapp (Denver & Rio Grande Western); Locomotive Fuel as a Comparative Performance Unit for Different Railroads, by Harrington Emerson; Fuel Conservation from the

Standpoint of the Locomotive Engineer, by C. J. Barnett (Illinois Central); Effect of Circulation on Locomotive Boiler Efficiency, by F. G. Lister (El Paso & Southwestern); Colloidal Fuel, by Linden W. Bates, and Assigned Cars for Railroad Fuel, by C. G. Hall (Walter Bledsoe & Co.).

Election of Officers

The following officers were elected for the coming year: J. N. Clark (Sou. Pac.), president; M. A. Daly (Nor. Pac.), P. E. Bast (D. & H.), and J. W. Dodge (Ill. Cent.), vice-presidents; O. J. Brown (Boston & Maine), E. E. Chapman (A. T. & S. F.), Robert Collett (N. Y. C.), J. R. Evans (M. K. & T.), and T. Duff Smith (Can. Nat.), members of the executive committee.

Exhibitors at the Fuel Association Convention

AT THE ANNUAL MEETING of the International Railway Supply Men's Association, held at the Auditorium Hotel, Chicago, on May 23, the following officers were elected for the coming year: V. W. Ellet, Hunt-Spiller Manufacturing Corporation, president; C. W. Sullivan, Garlock Packing Company, vice-president; A. W. Clokey, American Arch Company, secretary, and A. C. Beckwith, Ohio Injector Company, treasurer. At a board of directors' meeting it had been decided to honor the past presidents of the association with permanent badges. These badges were presented to F. N. Bard, Barco Manufacturing Company, first president and organizer of the association; C. W. Floyd Coffin, Franklin Railway Supply Company, second president; W. G. Clark, Locomotive Stoker Company, third president; C. L. Mellor, Barco Manufacturing Company, fourth president, and to the retiring president, G. E. Ryder, The Superheater Company.

The following is a list of exhibitors at the 1922 convention of the International Railway Fuel Association at the Auditorium Hotel, Chicago:

American Arch Company, New York—Represented by J. T. Anthony, T. M. Mahar, Chas. Pfeiffer, E. L. Mulcahy, W. W. Neale, M. L. Smith, F. G. Boomer, J. Brondon, A. M. Sucese, H. Darby, J. P. Neff and W. L. Allison.

Barco Manufacturing Company, Chicago.—All-metal engine and tender connections, reservoir joints, smoke box blower fittings, power reverse gear, and crosshead and shoes. Represented by F. N. Bard and C. L. Mellor.

Boss Nut Company, Chicago.—Lock nuts, bolts and rivets. Represented by J. W. Fogg and A. W. MacLean.

Dearborn Chemical Company, Chicago.—Literature. Represented by Geo. R. Carr, I. H. Bowen, L. P. Bowen, O. H. Rehmeyer, I. H. Beebe, N. F. Dunn, J. G. Arn and H. P. Ross.

Detroit Lubricator Company, Detroit, Mich.—Literature. Represented by A. G. Machesney.

Edna Brass Manufacturing Company, Cincinnati, Ohio.—Lubricators, injectors, boiler fittings, reflex gages, fire extinguishers, cold water squirt. Represented by H. A. Glem and F. S. Wilcoxen.

Fairbanks, Morse & Co., Chicago.

Franklin Railway Supply Company, New York.—Power reverse gear. Represented by W. H. Coyle, J. L. Randolph, H. M. Evans, M. H. Roberts, Paul Willis, J. A. Talty and J. L. Bacon.

Garlock Packing Company, Palmyra, N. Y.—Asbestos packings for locomotives and general railway supplies. Represented by John L. Fisher and Stanley McDale.

Hudson Grate Company, Keokuk, Ia.—Locomotive grate equipped with shaking dump grate. Represented by A. W. Hulson and J. W. Hulson.

Johns-Manville, Inc., New York.—Pipe and boiler insulation, monolithic baffle walls, steam traps, packings and gaskets, high temperature cements. Represented by P. R. Austin, L. S. Wilbur, H. J. Crowe, P. C. Jacobs and A. H. Purdon.

Locomotive Firebox Company, Chicago.—Thermic syphon. Represented by C. M. Rogers.

Locomotive Stoker Company, Pittsburgh, Pa.—Working model of stoker. Represented by A. C. Deverell, A. M. Willsie, J. B. Ball, I. C. Jordan, C. F. Fahler, V. B. Emerick, E. F. Milbank and E. R. Funk.

Manning, Maxwell & Moore, Inc., New York.—Gages, safety valves, inspirators, boiler checks and other locomotive appliances. Represented by C. L. Brown, J. Soule Smith and C. W. Corning.

Nathan Mfg. Company, New York.—Injectors, lubricators, boiler checks, water columns, gage cocks, water gages, coal sprinkler, fire extinguishers, boiler washer and tester whistles. Represented by Richard Welsh, Frederick C. Davern and Fred Ehredt.

National Railway Devices Company, Chicago.—Radial and vertical fire door. Represented by Jay G. Robinson and E. J. Gunnison.

Ohio Injector Company, Chicago.—Lubricators, automatic drifting valves, automatic flange oiler, injectors, fire jet, boiler check, low water alarm. Represented by William S. Furry, Frank W. Edwards, W. H. Malone, F. B. Farnsworth, N. W. Barker and A. C. Beckwith.

Okadee Company, The, Chicago.—Valves, water glass protectors, front end hinges, cylinder cocks. Represented by W. H. Heckman, G. S. Turner, Chas. R. Long and A. G. Hollingshead.

Peabody Coal Company, Chicago.—Photographs and moving pictures of coal production. Represented by J. H. Westervelt, F. E. Sammons and W. F. Royce.

Railway Review, Chicago.—Publications. Represented by L. G. Plant.

Roberts & Schaefer Company, Chicago.—Photographs of locomotive coaling plants and cinder conveyors, and combination portable coaling and cinder handling and storage plant. Represented by Clyde P. Ross and David E. White.

Simmons-Boardman Publishing Company, New York.—Publications. Represented by L. B. Sherman, C. B. Peck, Homer Beach and J. M. Rutherford.

Standard Stoker Company, New York.—Literature and photograph of locomotive equipped with stoker. Represented by F. P. Roesch.

Superheater Company, The, New York.—Feed water heating apparatus and steam pyrometer. Represented by G. E. Ryder, J. E. Mourne, R. M. Osterman, H. V. Jones, C. H. True, H. B. Oatley, Geo. Dolan, R. R. Porterfield, Bard Browne, W. A. Buckley and R. J. VanMeter.

Vissering & Co., Harry, Chicago.—Packing and sanders. Represented by W. H. Heckman, G. S. Turner, Chas. R. Long and A. G. Hollingshead.

Worthington Pump & Machinery Corporation, New York.—Photographs and literature on locomotive feed water heater. Represented by John M. Lammedee.

The Development of Welded Flexible Staybolts

THE INCREASE in the size of boilers, accompanied by higher pressure, led to considerable trouble with staybolts in the breaking zone of the firebox. This difficulty was almost entirely overcome by the development of the flexible staybolt, consisting of a threaded sleeve screwed into the sheet, a bolt having a spherical head seating in the

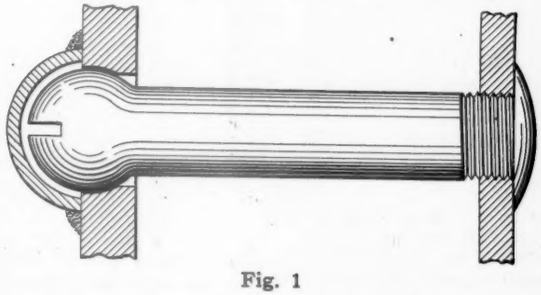


Fig. 1

sleeve and screwed into the other sheet, and a cap covering the sleeve. This type had certain disadvantages principally due to the necessity of making a threaded connection that would remain absolutely steam tight. Steam-tightness in a threaded sleeve requires perfect threads, which in turn necessitates the use of steel sleeves, regardless of the fact that steel

sleeves are subject to crystallization and consequent breakage when caps are removed at inspection intervals or when fireboxes are being renewed. The use of sleeves of the threaded type also demands the cutting of large holes in the wrapper sheet which is detrimental. These holes must be carefully reamed and threaded with straight and taper tools. This is an expensive operation and if not properly performed will cause continuous trouble or possible failure in service.

To overcome these difficulties and to obtain a rigid, steam-tight connection, R. S. Mennie early in 1914 conceived the idea of utilizing the electric welding process as a means of making an absolutely steam-tight connection for the wrapper sheet housing of a flexible staybolt. In his original patent, Mr. Mennie covers broadly all forms of welded-on flexible

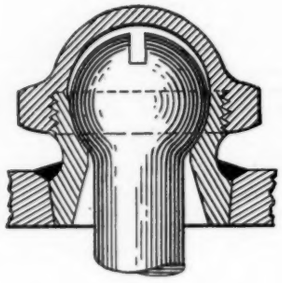


Fig. 2

staybolt connections. His first welded staybolt application is shown in Fig. 1 and while exceedingly simple has the objection that staybolt inspection is not provided for. To overcome this defect the staybolt head was enclosed in a sleeve or housing which was welded to the sheet. This construction is shown in Fig. 3 except that Mr. Mennie used a flat head bolt and cap to correspond.

In 1915 the Flannery Bolt Company patented a tapered sleeve type, the sleeve being secured by arc welding and providing a recess in which rested the head of the flexible bolt. The sleeve was also provided with a removable cap for inspection purposes, as shown in Fig. 2.

The original Mennie type had shown possibilities in

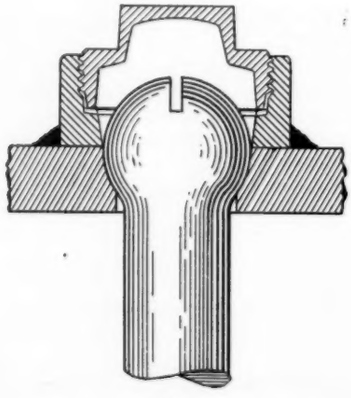


Fig. 3

eliminating two great defects in the threaded type of flexible staybolt; namely, the large hole in the sheet and the great number of sleeves required to take care of all angles in the sheets. It was found that the tapered welded sleeve possessed these two great defects of the threaded type of sleeve, as practically as large a hole and as many different sizes of sleeves were required. The large opening in the boiler sheets has been objected to, particularly in combustion chamber areas, and in crown sheet installations, in which it was it was attempted to meet the A. S. M. E. Boiler Code Committee formula with the threaded sleeve.

A modification of the Mennie type was made, as shown in Fig. 3, in which the bolt rested in a counterbored recess in the sheet and was inclosed in a housing welded to the sheet and provided with a removable cap for inspection

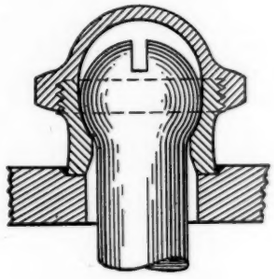


Fig. 4

purposes. This type was confined to flat surfaces and was not applicable to curved sheets and bolts set at an angle with the sheet. A sleeve resting on the sheet, as shown in Fig. 4, and a sleeve in the sheet but having a shoulder resting on the sheet, Fig. 5, and secured by welding were tried but lack of simplicity, economy and other disturbing factors

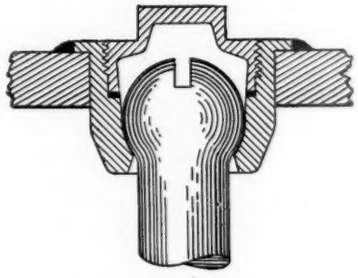


Fig. 5

finally led to their rejection. Numerous other types followed without success.

Continued investigation brought out the universal type, Fig. 6, which provided a sleeve with a seat formed as a segment of a sphere resting in a corresponding counterbore in the sheet. This accommodates itself to any curvature

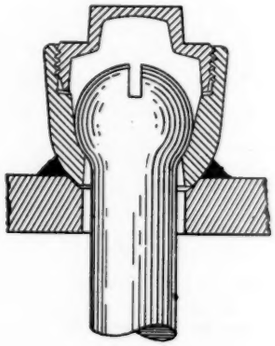


Fig. 6

of the sheets, and to any degree of angle at which stays are ordinarily applied, the opening in the boiler sheets being only sufficient to provide clearance for the size of bolt used. Where there is not enough clearance for the head outside the sheet the special flush type, shown in Fig. 7, is used.

The welded flexible staybolt, with a sleeve having a

spherical seat in the sheet, was first publicly introduced in 1919 and has been widely used since that time. In this type a single size of sleeve replaces the many styles and standards formerly required. The sleeve is also more satisfactory because being forged from the ductile material it does not

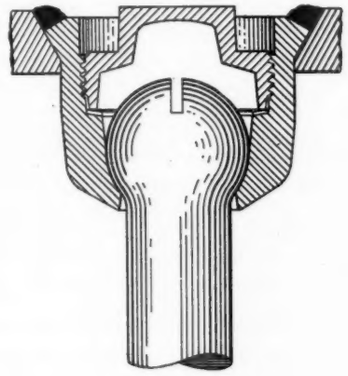


Fig. 7

crystallize and crack, does not require the expensive care and skill for application that was needed with the threaded type and eliminates the leakage troubles experienced in that type.

With the introduction of the welded flexible staybolt in 1919, the question was raised by some users whether the electric weld might be injurious to the sheets. It was pointed out that for several years built-up bosses were welded on the wrapper sheet to give a better threaded surface where the bolts enter the outside sheet at an excessive angle. Thousands of locomotives in daily service for a long period had unquestionably demonstrated that the sheets are not injured by the bosses and inasmuch as far less welding is required for a flexible welded sleeve than has been the practice in building up bosses, it follows that the small amount required for the welded sleeve should not be injurious.

A typical application of the universal type is illustrated by the boiler for a Santa Fe type locomotive, shown in Fig.

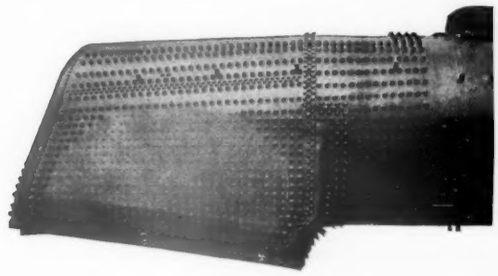


Fig. 8

8. With the exception of seven flush sleeves in the back head, the entire installation of 1,160 bolts in each boiler requires only the one style universal sleeve. The manner in which this type adapts itself to installation in seams and flanges is noteworthy, the sleeve being but little larger than the rivet heads and the hole only sufficient to provide clearance around the bolt, practically no larger than is used for rivet holes. This aids in maintaining maximum strength.

Northern Pacific Ton-Mileage Cut 33 Per Cent

Has Surplus After 7 Per Cent Dividends of $4,705,399 Due to Burlington's Extra Disbursements

THE MOST IMPORTANT question in reference to Northern Pacific is as to how soon it may be able to restore its former annual dividend rate of 7 per cent on its stock. This statement is based on the presumption that the company has in mind to restore the 7 per cent rate and that the reduction to 5 per cent, made last March, was a temporary step taken because of the Northern Pacific's earning position at that time. The company has been paying dividends at a rate of 7 per cent since 1903.

At the meeting in March, the quarterly rate was made 1¼ per cent and Howard Elliott, chairman of the board, made the following statement: "In declaring a dividend of 1¼ per cent . . . the directors feel that they are best serving the interests of the stockholders and are hopeful that conditions will warrant the resumption of the rate of 1¾ per cent quarterly in the future." More recently, Mr. Elliott wrote in reply to a stockholder, that "at the recent meeting of the directors, at which the dividend was reduced, it was decided that it would not be conservative, in view of the prevailing conditions of uncertainty, to pay the full rate. I cannot say when it will be restored, but at that time the board hoped that business would resume next autumn to such an extent as to justify that action. The returns of the Northern Pacific for the first three months of this year are discouraging. Business is better, but there are still many elements of uncertainty."

The Northern Pacific was enabled to pay its 7 per cent dividends in 1921 because of the extra dividends which it received on its Burlington shares, which extra payments aggregated $13,000,000 more than Northern Pacific will receive from the Burlington this year. The road's annual report showed for the year an income balance after dividends of $4,705,399, as compared with $1,734,183 in 1920. The 7 per cent dividends totaled $17,360,000. The explanation of the size of the 1921 surplus was an increase in dividend income, as compared with 1920, of $17,505,094. In 1920 the road's dividend income was $4,353,552, whereas in 1921 it was $21,858,646. It was this increase which enabled the road to make up for the extremely poor showing which it had in its railway operating results.

Has Not Been Doing Well Since 1918

The road had not been doing very well since 1918. It had a standard return or compensation for operation by the government during federal control of approximately $30,000,000. In 1918 it nearly earned this amount with a net after rentals of $28,000,000. In 1919, however, it earned for the government only $18,000,000. In 1920, operating for two months under federal control, six months with the benefit of the guaranty, and four months "on its own," it realized on an extremely heavy traffic to the extent only that it was able to earn a net after rentals of $7,949,458. The 1921 revenue ton-mileage was 32.64 per cent below the 1920 business but the road was able to come through the year with a net after rentals of $10,843,826. This is one-third of the amount that it would need to be on something like the pre-war basis of net income.

In view of these facts, it is not hard to understand why the

Northern Pacific directors should have decided to decrease the dividend rate from 7 to 5 per cent. If it had not been for the Burlington's extra dividend declarations, the deduction would have presumably had to be made much sooner than it actually was made, although, of course, the fact still remains that the road might have maintained the regular dividends and paid them from surplus. The Northern Pacific directors, however, prefer to adopt the conservative course.

In the statement which Chairman Howard Elliott recently made to one of the stockholders, as above noted, Mr. Elliott commented upon the fact that business had not enabled the road to show very good earnings for the first quarter of 1922. The actual figures showed for March a net after rentals of $1,160,077, as compared with a deficit of $261,-017 in March, 1921. The March, 1922, earnings, however, were in rather sharp contrast with the earnings in January and February with the result that the three months net after rentals was only $338,802. This compared with a deficit of $861,880 in the first three months of 1921, but it can easily be seen that the Northern Pacific earnings are far from being on a rate which properly called for a 7 per cent dividend basis. Of course, there is also the circumstance that the roads in the northwest make the better part of their earnings in the latter half of the year and the earnings for the first few months of the annual period must be regarded with that in mind.

The Northern Pacific car loadings at the present time are picking up in fairly good shape. They are running ahead of the loadings for the corresponding period of last year and this is another factor which must be taken into consideration. The Northern Pacific does not seem to be hurt very much by the present coal strike; in fact, its coal business is not such a very essential part of its total traffic. The lumber business, however, is showing a very pleasing improvement. The ore traffic has not yet begun to show any sign of life.

Northern Pacific, No Exception to Other Roads in Northwest

One of the most striking features of railway operations in 1921, as a whole, was the rather unfortunate manner in which the depression of 1921 was reflected in the operation of the roads serving the northwest. The Northern Pacific, the Great Northern, the St. Paul, and even the North Western, went through a very similar sort of year. Each of them had difficulties of a very unusual sort. The Great Northern, because of the year's operations, has been put in a position where it is looked upon with more or less uncertainty, particularly since it decided to put its dividends on a semi-annual instead of a quarterly basis. The St. Paul, with a problem of its own, approached the dangers of receivership. The Northern Pacific was compelled to reduce its dividend rate. The details of what it did during the year may be summarized as follows:

The road's revenue tonnage in 1921 was 17,670,162, as compared with 23,448,182 in 1920. This was a reduction of 24.64 per cent. There was a reduction in revenue ton-mileage of 32.64 per cent, due to a decrease in the average haul from 334.9 in 1920 to 299.4 in 1921. The decrease in freight revenue was 14.61 per cent, this lesser proportionate decrease being due to an increase in the receipts per ton mile from 1.033 cents in 1920 to 1.309 cents in 1921. The reductions in the passenger business were equally severe, the decrease in number of revenue passengers being 26.87 per cent; in revenue passenger miles, 29.71 per cent, and in revenue, 19.53 per cent.

The Northern Pacific divides its total tonnage into that originating on the road and that received from connections. The 1921 tonnage, as was noted above, totaled 17,670,162. Of this total 14,125,875 originated on the Northern Pacific's own rails and 3,544,287 was received from connections. This points out the degree to which the Northern Pacific originates its own tonnage. The reductions in tonnage which took place in 1921 as compared with 1920 were general, except that there was an increase in the tonnage of grain. The 1921 grain figure was 2,657,431 tons, an increase of 374,350 over 1920. Products of agriculture totaled 4,545,-776, an increase of 143,529 over 1920. The tonnage of products of animals in 1921 was 302,120, a decrease of 136,-441 from 1920. The decrease in products of mines was decisive; the 1921 figure was 4,667,842, as compared with 7,328,036 in 1920, a decrease of 2,660,194 tons. This decrease was embodied primarily in the reductions of traffic in coal and ore. The 1921 bituminous tonnage of 2,896,070 compared with 4,264,262 in 1920 and the ore tonnage of 517,-034 compared with a 1920 figure of 1,377,337. The tonnage of products of forests in 1921 was 5,525,854, as compared with 7,253,665 in 1920, a reduction of 1,727,811. The manufactures and miscellaneous tonnage carried in 1921 totaling 2,032,244 compared with 3,194,497 in 1920.

Revenues and Expenses

The Northern Pacific's 1921 freight revenues were $69,-246,505 as compared with $81,090,390 in 1920. The total revenues in 1921 were $94,538,059 as compared with the 1920 figure of $113,084,408. As against a decrease of $18,-546,348 in railway operating revenues, which amounted to 16.4 per cent, there was a decrease of $23,353,007 in operating expenses. The actual operating expenses in 1921 were $77,630,867, as compared with $100,983,874 in 1920. The reduction was 23.3 per cent. In 1921 the road operated on a ratio of 82.12, as compared with 89.3 in 1920. In 1917, the last year before government control, the road had a ratio of 60.41. This indicates what has already been said above concerning the fact that the Northern Pacific is far from being on a pre-war basis in net earnings, but at the same time, it indicates a rather favorable condition because it must be borne in mind that this reduction in operating expenses and in the operating ratio, was made in the face of reductions of nearly one-third in freight and passenger traffic.

The reductions in operating expenses were made as follows: The charges for maintenance of way were $14,312,-916, a decrease of $6,699,882, or 31.88 per cent. Maintenance of equipment was $21,825,817, a decrease of $3,-768,106, or 14.72 per cent. Transportation totaled $35,-797,967, a decrease of $12,641,035, or 26.10 per cent. The reductions in maintenance were, to some extent, due to lesser work being done, as well as to economies through decreased cost of wages and materials. In 1921 the road relaid 26 miles of rail, as compared with 154 in 1920. It ballasted 183 miles of track as compared with 238 in 1920. Main line tie renewals were 1,072,530 as compared with 1,395,-094 in 1920, and a proportionate reduction was made in branch line tie renewals. The larger part of the road's main line is laid with 90-lb. rail. The maintenance of equipment condition, which evidences the result of the reductions in maintenance expenses, is shown by a percentage of bad-order cars on the Northern Pacific on May 1 of 10.4 per cent, which compared with the country's average on that date of 14.4. The unserviceable locomotive percentage on the same date was 19.2, as against the country's average of 20.2. This indicates savings in maintenance of equipment such as were evidenced in the case of maintenance of way, but the Northern Pacific is in better shape than the average of the roads of the country.

Students of Northern Pacific railway affairs are watching with interest the progress which the company is making with reference to oil traffic from the fields along its line. The annual report says that "during 1921 there was marked progress in oil exploration in Montana. . . The Cat Creek field continued to be a large producer. During the year 1,317,143 barrels were produced and shipped from 68 wells, making a total since the first shipment in August, 1920, of

1,547,261. In the Devil's Basin field there are two producing wells. In February, 1921, the Soap Creek oil field, in southern Bighorn County, was discovered. Drilling is actively in progress in both the Devil's Basin and Soap Creek fields, as well as in a number of other localities in central and eastern Montana. So far the production of oil from any lands owned or controlled by your company has been very small. The company, however, owns a large acreage in districts, the geology of which indicates oil possibilities."

One of the reasons for the recent change in the fortunes of the southwestern carriers has been the oil development along their lines. The situation as to Northern Pacific, however, does not yet seem to partake quite of that character. The total crude petroleum traffic which it originated in 1921 totaled only 1,178 tons, which shows that oil traffic is not yet very evidently much of a factor in earnings.

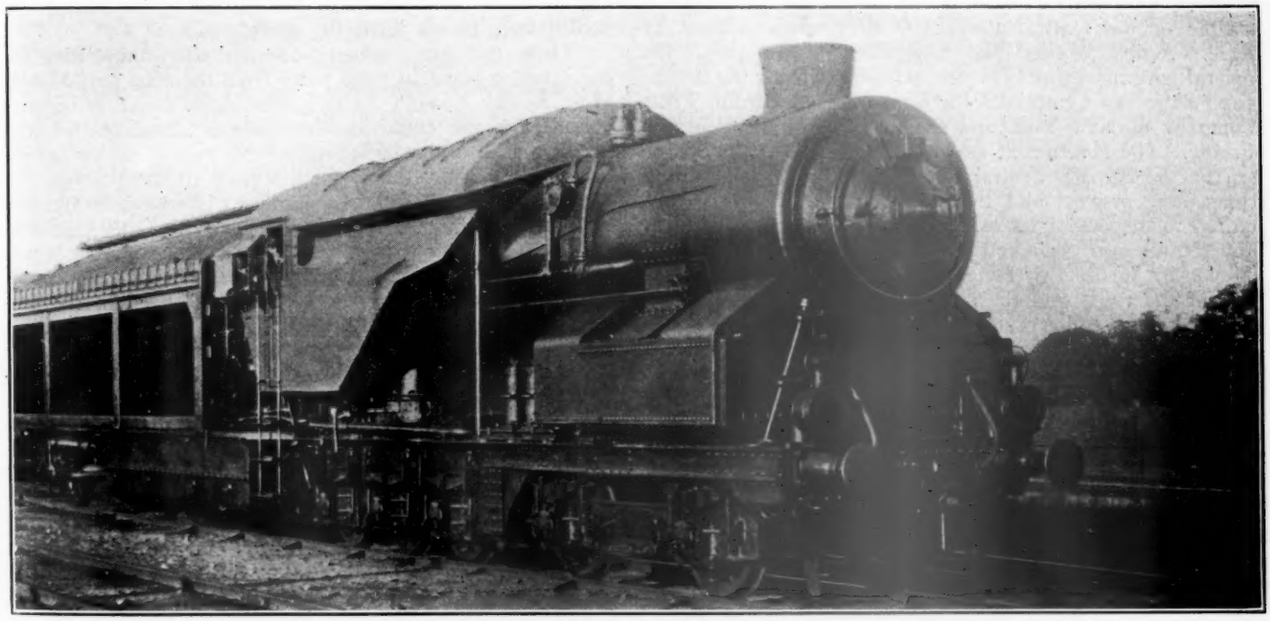
Turbine Locomotive Saves 52 Per Cent in Fuel

Design Brought Out by Ljungstrom Turbine Company of Sweden Has Many Novel Features

A CONDENSING TURBINE locomotive, designed by F. Ljungstrom and constructed by Aktiebolaget Ljungströms, Angturbin, Stockholm, Sweden, was placed in service on the Swedish State Railways a few months ago. According to reports, the locomotive has performed satisfactorily and has shown remarkable economy in fuel. Complete details of the construction are not yet available but the photograph shown herewith indicates that it is a radical departure from conventional locomotive design.

The turbo-locomotive designed by Mr. Ljungstrom is intended to displace the Pacific type locomotives now used in passenger service on the Swedish State Railways. It is not a mere adaptation of the turbine to reciprocating locomotives, but is a new design in all respects. Unlike ordinary steam locomotives, there is no driving machinery under the boiler. Instead it is supported by two trucks, the forward with two and the rear with three axles. The driving machinery is located under the tender unit, which also contains the condenser and the necessary fans for aiding in condensation. The coal supply is carried in bunkers placed above and on each side of the cab, having a capacity of seven tons. The boiler is of the ordinary fire-tube type, carrying 285 lb. pressure. It has no small tubes, the heating surface in the barrel of the boiler being made up of large flues, each of which carries a superheater element, thus giving a high degree of superheat.

Another innovation is the arrangement for heating the air supplied to the fire. The space between the mud ring and the ashpan is tightly closed and the air needed for combustion passes through a special air preheater under the smokebox, where the temperature is raised by escaping gases from the smokebox. Draft is created by a fan propelled by a small turbine. A damper connected with the firebox door shuts off the draft when the door is open, thus preventing unnecessary cold air entering the firebox flues. The exhaust steam is not discharged from the stack but is led to a condenser on the tender.



Turbine Locomotive on the Swedish State Railways

The driving machinery consists of a high-speed turbine suitably geared to the six-wheel connected running gear which has drivers 58 in. in diameter and is located under the tender. The condensing tank has a capacity of 3,650 gallons but only half of that amount has been carried on the trial trips and has been found sufficient as the exhaust steam is not wasted through the stack but returns to a hot well from which it is pumped into the boiler as feedwater. As the feedwater is used over and over, very little scale will

be formed in the boiler. The preheating of the air for combustion should also add to the life of the firebox.

The locomotive is being used in passenger service out of Stockholm on turn-around trips of 66 kilometers, or about 41 miles, each way. The time between the departure from Stockholm and the return is 2 hrs. 30 min. As no information is given as to the time at the turn-around point or the length of the stops en route, no estimate can be made as to the speed while on the road.

On a local run on this route with a passenger train weighing 603 tons, the coal consumption was 20.8 kilograms (45.8 lb.) per 1,000 ton kilometers, or about 67 lb. per 1,000 gross ton-miles. In through service the consumption was reduced to about 11.6 kilograms (25.6 lb.) per 1,000 ton kilometers, or 37.4 lb. per 1,000 gross ton-miles. Considering that this performance was obtained during the winter season the figures are indeed remarkable. Compared with the reciprocating superheated Pacific type locomotives used on the same run, the turbine locomotive shows a reduction of 52 per cent in the consumption of fuel. Further details of the locomotive will be published in a later issue.

Separation of Southern Pacific and Central Pacific Ordered

WASHINGTON, D. C.

REVERSING the decision of the district court for the eastern district of Utah the United States Supreme Court, in a decision handed down on May 29, directed that a decrease be entered severing the control by the Southern Pacific of the Central Pacific by stock ownership or by lease. Action to effect the dissolution was begun by the federal government in 1914, the defendants being the Southern Pacific and Central Pacific companies, the Union Trust Company of New York and the directors of the Southern Pacific. The government asked that the lines of the Southern Pacific and the Central Pacific be decreed to constitute competitive systems and that the Southern Pacific be required to dispose of its ownership of stock and relinquish any control over the Central Pacific. A large part of the opinion by Justice Day reviewed the history of the organization of the roads and the case in which the separation of control of the Union Pacific and Southern Pacific was required, holding that the Southern Pacific-Central Pacific case does not differ from the former in principle.

"Such combinations," the court said, "not the result of normal growth and development but springing from the formation of holding companies or stock purchases resulting from the unified control of different roads or systems naturally competitive, constitute a 'menace and a restraint upon that freedom of commerce which Congress intended to recognize and protect and which the public is entitled to have protected.' "

After citing a number of cases as supporting this principle the court said: "These cases collectively establish that one system of railroad transportation cannot acquire another, nor a substantial or vital part thereof, when the effect of such acquisition is to suppress or materially reduce the free and normal flow of competition in the channels of interstate trade." It added that proof was ample that the policy of the Southern Pacific system has been to favor transportation on its lines by securing for itself, whenever practicable, the carriage of freight which would normally move eastward or westward over the shorter line of the Central Pacific for its own much longer and wholly owned southern route, and reached the conclusion that the stock ownership in the Central Pacific acquired by the Southern Pacific is violative of the Sherman act within the principles settled by the court in previous cases.

So far as compatible, the court said, the mortgage lien of the Union Trust Company of New York should be protected.

The several terminal lines and cutoffs leading to San Francisco Bay, which have been constructed or acquired during the unified control of the two systems for convenient access to the bay and to the principal terminal facilities about the bay, should be dealt with, the court declared, "either by way of apportionment or by provisions for joint or common use, in such manner as will secure both companies such full, convenient and ready access to the bay and to terminal facilities thereon that each company will be able freely to compete with the other, to serve the public efficiently and to accomplish the purpose of legislation under which it was constructed."

A like course should be pursued, Justice Day added, "in dealing with the lines extending from San Francisco Bay to Sacramento and to Portland, Ore."

"The Central Pacific with its eastern connection at Ogden, forms one great system of transportation between the East and the West," the opinion stated, "and the Southern Pacific with its roads and connections and steamboat lines forms another great transcontinental system for transportation from coast to coast. The Central Pacific constitutes some 800 miles of transcontinental line, of which it is a part. The Southern Pacific system has practically its own line of railroads and steamboat connections to New York, via Galveston and New Orleans."

The acquisition of the Central Pacific stock by the Southern Pacific was held to be unlawful under the opinion of the court in the Union Pacific case, "unless justified by the special circumstances relied upon" for that purpose, but the court after analyzing the special circumstances discarded them as not justifying the control.

"These two great systems are normally competitive for the carrying trade in some parts from the East and Middle West to the Coast," Justice Day said, "and in greater volume for the traffic moving to and from central and northern California, including a great volume of the ocean-borne traffic which lands on the coast destined across the continent to the Atlantic seaboard and intermediate Western and Eastern points or is destined from the latter points to foreign ports via San Francisco or other Pacific coast points." The court said the roads "were always separate and distinct corporations. They were so recognized in the acts of Congress making land grants to them . . . . and otherwise conferring rights on them which only Congress could confer."

"For a good part of the time," it added, "the roads had boards of directors not consisting of the same persons. At times the majority of the stock was separately held."

The court refused to accept the theory of prior practical consolidation as a justification for a violation of the Sherman act. The bearing of the 99-year lease of the Central Pacific, made in 1885, was reviewed, the court reaching the conclusion that it could not have been legally made without authorization by Federal legislation, which was never given.

"We find nothing in these leases to the Southern Pacific company," the justice said, "which justifies the continued control of the Central Pacific by the Southern Pacific after the Sherman act became effective."

In a dissenting opinion Justice McKenna said he considered the decision of the court unjust; that there was no thought in anyone's mind that the acquisition of stock by the Southern Pacific would be a restraint upon competition or a detriment to the public interest.

The tentative consolidation plan issued by the Interstate Commerce Commission last year leaves the Central Pacific in the proposed Southern Pacific-Rock Island system, although Professor Ripley in his report had recommended that the Central Pacific be made a part of the Union Pacific-Chicago & North Western system.

Canadian Political Situation and Railway Policy

Progressives Hold the Balance of Power in Parliament and Favor Nationalization of Railways

By J. L. Payne

CANADA IS NOW definitely committed to public ownership of railways on a large scale. There was some doubt after the general elections of December last as to what would be the policy of the new Government; but that doubt no longer exists. The administration has announced its determination to follow pretty closely the course laid down by its predecessor. At all events the departures are few and unimportant.

The political situation as it bears on railway policy is somewhat extraordinary. The Liberals, under Hon. W. L. MacKenzie King, are in power, yet they have not a majority in Parliament. The key is held by a group of 65 Progressives, representing the same interests as does the "farm bloc" at Washington. Among the Liberals there is a strong feeling against public ownership. It is understood, for example, that the Quebec contingent, representing more than half of the entire Government strength, is a unit on that point. The Conservatives are about evenly divided on the issue; but they make up not more than 55 in a House of 235. The Progressives, standing somewhat aloof, hold the balance of power, and they are practically to a man in favor of nationalization. Speaking broadly, they represent the farmers of the country, although chiefly those of the western provinces.

Parliament Has Never Sanctioned Nationalization

The foregoing explanation is perhaps necessary in order that the Canadian situation may be understood by American readers—I mean the situation in Parliament. As for the people at large, it would be quite impossible to say where they stand on the question of railway policy. They have never declared themselves. They have never once had an opportunity to do so. Although two general elections have been held since nationalization was tacitly begun in 1914—one of them since that policy was definitely adopted in 1918—the matter has not been an issue before the electorate. That may seem extraordinary; but it is strictly true. The Conservatives, who held the reins of power from 1911 down to December last, were overwhelmingly defeated at the polls; yet that defeat could not be construed as a rebuke for their attitude in respect of public ownership, for the sufficient reason that it was scarcely mentioned in the campaign.

To outsiders it must seem inexplicable that a nation like Canada, intensely democratic in sentiment, could be committed to a course of action quite radical in its broad features, and involving the assumption of enormous liabilities, without public approval. The facts of the case rather intensify the anomalous aspect of what has happened; for it might be said that this important policy was fastened on the Dominion without even the direct sanction of Parliament. The positive steps in the matter were taken by Government, and all that can be said is that Parliament did not intervene. The Government at that time had a numerically strong majority at its back, and in this negative, or passive, position of its supporters one gets a vivid flash of the party system.

Progressives in Control

The pivotal position of the Progressives at the present time is well illustrated by an occurrence which may be of interest to American readers. In 1897 the Canadian Pacific desired a loan of $3,300,000 to finance the building of its Crow's Nest Pass line in the west, and the Minister of Railways of that day took advantage of this need to drive a bargain. He required the Canadian Pacific to make certain specific reductions in rates in return for the loan; and that was done. The Railway Commission did not come into existence until six years later. Freight tolls actually moved downward in slight degree until 1916, and then in 1918 they moved violently upward. Under the War Measures Act the whole question of rates was referred to the Railway Commission, and the Crow's Nest Pass agreement was suspended by that Board until July 7 next. With tolls 65 per cent higher than in 1897, the Progressives are now tacitly demanding that the agreement in question shall become operative in July next. Of course, on analysis, it has developed that there are both legal and other difficulties in the way, and the whole matter is being considered by a committee of Parliament; but one gets in this incident a glimpse at the general attitude of these western Progressives toward railway policy. When that agreement was made the Canadian Pacific operated about 8,000 miles of lines, as compared with nearly 14,000 at the present time, and it was the only trunk line in the west. Now there are three.

When the first session of the present Parliament began, with a new Government at the helm, there was great uncertainty as to what would be done in the matter of public ownership; but all doubt was dispelled by the announcement made at the formal opening, and confirmed later by definite statements from the Minister of Railways and Canals. All changes in contemplation were comprehended within the somewhat indefinite term of "co-ordination." It transpired that this did not mean very much—certainly nothing which would in any material way alter the policy that had been followed ever since nationalization received its first demonstration. When explanations came to be made, it was found that Government merely proposes to abolish the old Canadian Northern board and the Grand Trunk board and have but one executive body. This will be done under the Canadian National Railways Act of 1919; so that there is no room for surmise as to the precise nature of the administration under which the public railways of Canada will be carried on.

The Canadian National Railways Act provides for a board of directors which will not only be appointed by Government, but will be at all times, and under all circumstances, answerable to the Minister of Railways. The minister may remove any member of the board at will "for cause." That term is so comprehensive and elastic, there is no question whatever that the door will remain wide open for political control. It had been urged in the public press that steps be taken to place a board in charge which would have the power and courage to make sweeping changes, especially in the removal of wasteful parallels in the west; but that appeal has not been heeded. All the evils and drawbacks which attached to the public railway system since its inception, with the measuring of all administrative policy in terms of political expediency, may be perpetuated.

It is not suggested that the lessons of experience will be disregarded; but there can be no doubt that the way is clear for the assertion of the same measure of direct political control which obtained from 1914 downward. In other words, "co-ordination" simply means the substitution of an obvi-

ously practicable form of executive organization for one which was irregular and contrary to the statute. It does not, however, place an independent board in charge.

It would also appear that the enforced absorption of the Grand Trunk has been ratified by the new Government, in which matter we see again the play of political expediency. The Quebec members, numbering 65 out of a total of 117 on the Liberal side, was understood to be strongly opposed to the wrenching of the Grand Trunk out of the hands of its corporate owners. But the Progressives favored that step, and, as has been pointed out, the farmers' party holds the balance of power in the House. The Grand Trunk cannot contribute anything of value to the government system. On the contrary, it stands a good chance of adding to its weakness by being ruined.

The Grand Trunk Question

There are serious objections to the taking over by Government of this pioneer Canadian road, which held a unique position in that it had not received that generous measure of public aid which had been lavished on enterprises of modern date. In the first place, it was not bankrupt. It was in a stronger financial situation than is, for example, the Chicago, Milwaukee & St. Paul at the present time. It was simply embarrassed by reason of its endorsement of the securities of its subsidiary, the Grand Trunk Pacific, and if Government had relieved it of that liability it could have gone ahead indefinitely.

But that is not the most serious matter. The Grand Trunk must be regarded as more of an American than a Canadian road. Its western terminal is at Chicago and its eastern at Portland, Maine. It owns and operates nearly 1,700 miles of line in the United States. It derives 70 per cent of all its revenue from its American connections. Will it be able to maintain that valuable traffic, which is its very life-blood, when owned and operated by the Canadian government? Another objection is that its absorption by Government creates in the east a new series of those deadly parallels which make economical operation of public railways practically impossible in the west. Nor does it better matters to have the English shareholders crying out over what they call "the confiscation" of their stocks without a penny of compensation.

This reference to the American aspect of the Canadian railway situation suggests a matter of some importance which has not up to this moment been considered on its potential merits. With the taking over of the Grand Trunk, the Dominion Government becomes the owner and operator of 2,000 miles of line in the United States. It will be seen that this changes quite vitally the comity which has hitherto prevailed. That is to say, there is a material difference between the railway corporations of one country operating within the territory of the other country and the government of either country doing so. The question of rights of eminent domain may arise at any moment. Rivalries for traffic between Canadian and American companies, on both sides of the line, is one thing, and competition between American companies and the Canadian government on United States soil may be quite another. I am not raising this point. It has been definitely raised by influential journals in the United States, and put forward as a possible ground for serious international complications. In it we must all see one of the drawbacks which attach to the venture of the Canadian government into public ownership of railways.

Results of Government Operation

What has been the result thus far of the operation of 22,500 miles of railway by the Canadian government? Not encouraging. On the contrary, very discouraging. The deficit for 1921, as recently announced to Parliament, was placed at $72,500,000. For 1920 it was $70,300,000. On the operating side there was a betterment of about $20,000,000; but that was more than countervailed by the increase in fixed charges. Of course, the actual shortage on the government system was much larger than that given out in the public statement, since it omitted probably $60,000,000 of fixed charges on 4,000 miles of line and a capitalization of considerably more than a billion dollars. It must be understood that Government has bookkeeping methods which are all its own. There was some talk a few months ago about deferred charges, in order to help out the situation as to unemployment, and the facts in that regard are to be brought down.

There was a fair demonstration of economy on the government lines; yet that must be measured against the room that existed for retrenchment. Nothing is clearer than that the public railways in 1920 and 1921 were not only over-manned, but that they paid more for labor and got a much lower return in service than did the corporate roads. For example, on the Canadian Pacific, operating side by side with the Canadian Northern, which is the chief unit of the government system, the number of ton and passenger miles handled per employee in 1920 was 222,495, as compared with 153,019 on the latter.

The average trainload on the Canadian Northern was 350 tons, as against 529 tons on the Canadian Pacific, although the former has a much more favorable grade. Perhaps the most conspicuous difference between the two roads was in the matter of employees. When traffic began to fall off seriously between 1918 and 1919, the Canadian Pacific met the situation by reducing its working staff by 2,596. The Canadian Northern actually added 8,052. In government hands, by every reasonable and accepted test, efficiency on the Canadian Northern seriously declined, and it was certainly bad to begin with.

Perhaps the most alarming aspect of the entire public railway situation is the rapid rise of fixed charges. Government has been pouring out money by hundreds of millions on the capital side. Since 1914 the payments to meet deficits for extensions, equipment, standardization of lines and so on, has exceeded $600,000,000. The Canadian Northern has been the chief beneficiary. These advances to public railway units have passed into the Dominion debt, which has not been a comforting thing for a nation of less than nine millions of people already heavily burdened by their participation in the war. Nor is the outlook hopeful. There may come a time, with traffic buoyant, when the operating deficit will be balanced by earnings; but meanwhile the accumulation of capital liability will inevitably make the problem of ultimate solvency more difficult. The national credit is beyond question, although as high a financial authority as the Wall Street Journal has published "A Friendly Warning to Canada," in which the rather obvious truth in that regard was plainly discussed.

Not a Failure of Private Ownership

The defenders and advocates of public ownership insist that the Canadian railway problem was created by the failure of private ownership. They are only technically on good ground. The assertion of state control followed the collapse of the Canadian Northern and the Grand Trunk Pacific, both of which were on the surface like any other railway corporation. But only on the surface. When the veneer of corporate status is removed, it is discovered that they were wholly government enterprises. They were essentially political roads in every respect, and it was political expediency which lay back of the insane additions to mileage that brought about their downfall under their own weight.

One fact alone should determine their proper classification. They did not have to finance their capital on the merits of their undertaking. Not at all. Practically every penny of their hundreds of millions of outstanding bonds

were endorsed by Government, in which case the purchasers were absolutely indifferent as to whether or not the railways themselves ever earned a farthing. They were secure. And the very moment the inflow of public money ceased—not after years of struggling and then being pinched by adverse circumstances—these roads were cast at the door of Government. Why? Because Government, as the guarantor of their liabilities, was the real owner. Government also subsidized them heavily, and, in the case of the Canadian Northern, gave a large grant of public lands.

This being the plain and incontrovertible truth, it is in the last degree misleading to speak of public ownership being forced on the Canadian government because of the failure of corporate ownership. The Canadian Northern would have remained a relatively small and obscure railway if it had been dependent on its own resources, and the Grand Trunk Pacific would never have been heard of at all. These two roads were financed entirely on the credit of the country, and their merits as legitimate railway enterprises were wholly subordinate to their value in the winning of elections. There is not a shadow of doubt about that.

The outlook is not stimulating. The hope aroused by the primary announcement that a substantial reduction in the operating deficit had been won in 1921 was crushed by a later statement as to the large increase in fixed charges. Competent and sympathetic students of the facts of the case would have preferred an increase in the operating loss if it had been counterbalanced by a decrease in fixed charges. For the current year, there has thus far been a reduction of about $10,000,000 in gross earnings; but "with no general election in hand," as a member of Parliament observed the other day, there has been leeway for a practically corresponding cutting down of expenses. Meanwhile, the whole railway problem is receiving an increasing amount of public attention, in Parliament and out. It was created amid absolute indifference, because the war excluded the consideration of all other topics.

Freight Car Loading

WASHINGTON, D. C.

FREIGHT CAR LOADING again increased during the week of May 20 to 792,459 cars, which was 15,100 more than the total for the week before and compares with 770,991 during the corresponding week of last year and 862,074 in 1920. Increases as compared with the week before were shown in all classes of commodities except livestock and increases as compared with the corresponding week of last year in all classes except coal and ore. In the Pocahontas and Southern districts, which are enjoying a heavy coal traffic during the strike, the total loadings were in excess of those of 1920, but in the Eastern, Alleghany and Southwestern districts the loading was less than that of last year. The coal loading for the week was 81,267 cars, an increase as compared with the week before, but 78,665 less than for the corresponding week of 1921. With this amount of coal added the loading for the week would have exceeded that of 1920 as it was more than offset by the increase of 62,540 cars in the loading of miscellaneous freight and of 26,797 in merchandise, L. C. L. In two weeks the total increase in loading has been over 36,000. The summary as compiled by the Car Service Division of the American Railway Association follows:

REVENUE FREIGHT LOADED

SUMMARY—ALL DISTRICTS, COMPARISON OF TOTALS THIS YEAR, LAST YEAR, TWO YEARS AGO. WEEK ENDED SATURDAY, MAY 20, 1922

Districts	Year	Grain and grain products	Live stock	Coal	Coke	Forest products	Ore	Mdse. L.C.L.	Miscellaneous	Total revenue freight loaded: This year 1922	Corresponding year 1921	Corresponding year 1920
Eastern	1922	9,393	2,748	8,802	1,442	5,933	2,837	69,981	86,992	188,128	.....	.....
	1921	7,019	2,644	44,548	1,183	5,384	2,428	58,526	68,215	.....	189,947	199,939
Allegheny	1922	2,329	2,838	13,479	4,654	3,100	2,355	51,374	68,868	148,997	.....	.....
	1921	2,152	2,924	50,645	2,552	2,385	6,438	43,796	49,597	.....	160,489	182,041
Pocahontas	1922	18	90	28,447	883	1,338	34	6,133	4,079	41,186	.....	.....
	1921	153	114	24,221	185	1,190	23	5,115	3,559	.....	34,562	32,770
Southern	1922	3,267	2,202	21,930	709	19,711	915	37,854	41,511	28,099	.....	.....
	1921	4,594	2,036	18,779	575	14,278	764	35,841	33,957	.....	110,824	125,958
Northwestern	1922	11,202	7,728	3,424	1,296	18,109	8,160	30,353	36,701	118,973	.....	.....
	1921	7,985	6,617	4,129	700	14,350	18,571	26,805	30,564	.....	109,721	144,624
Central Western	1922	14,096	10,784	3,695	196	6,053	2,308	32,367	42,802	110,301	.....	.....
	1921	10,812	9,717	14,229	190	5,447	800	30,835	33,532	.....	105,562	115,434
Southwestern	1922	4,303	2,743	2,190	155	7,686	308	15,909	25,481	58,775	.....	.....
	1921	5,106	2,695	4,081	118	6,354	806	16,256	24,470	.....	59,886	62,208
Total Western districts	1922	27,601	21,255	9,309	1,647	31,848	10,775	78,629	104,984	296,049	.....	.....
	1921	23,903	19,029	22,439	1,008	26,151	20,177	73,896	88,566	....	275,169	322,266
Total all roads	1922	42,772	29,133	81,967	9,335	61,930	16,917	243,971	306,434	792,459	.....	.....
	1921	37,823	26,747	160,632	5,503	49,388	29,830	217,174	243,894	.....	770,991	.....
	1920	31,316	28,204	169,049	11,235	62,226	59,268	160,909	340,767	.....	.....	862,074
Increase compared	1921	4,949	2,386	.....	3,832	12,542	.....	26,797	62,540	21,468	.....	.....
Decrease compared	1921	.....	.....	78,665	.....	.....	12,913	.....	.....	.....	.....	.....
Increase compared	1920	11,456	929	.....	.....	.....	.....	83,962	.....	.....	.....	.....
Decrease compared	1920	.....	.....	87,082	1,900	296	42,351	.....	34,333	69,615	.....	.....
May 20	1922	42,772	29,133	81,967	9,335	61,930	16,917	243,971	306,434	792,459	770,991	862,074
May 13	1922	42,270	29,940	79,170	8,813	60,661	14,403	241,418	300,684	777,359	751,186	843,145
May 6	1922	40,125	30,496	75,410	8,124	57,132	11,766	242,945	289,751	755,749	721,722	843,184
April 29	1922	36,398	30,488	75,632	7,952	59,112	14,053	242,565	292,086	758,286	721,064	800,960
April 22	1922	33,371	28,114	63,445	7,759	55,859	9,770	239,484	276,536	714,088	704,632	717,772

The freight car surplus during the period from May 15 to 23 averaged 329,634, a decrease in a week of about 14,000. Of the total 79,534 were box cars and 208,691 were coal cars.

TWENTY CENTS A MEAL, or a total of $163,000, was the loss sustained by the Chicago, Milwaukee & St. Paul in the operation of its dining cars for the year 1921. About 817,000 meals were served and the average amount received was $1.05. It appears, however, that the cost, $1.25, was calculated without including the interest on the investment—say $50,000 per car—or the cost of hauling the cars.

On the Gulf, Colorado & Santa Fe Near the Washita Canon, Okla.

Santa Fe Back on Pre-War Earnings Basis

Income Available for Dividends, $39,331,662. Best Year But One in Company's History

THE ATCHISON, TOPEKA & SANTA FE'S net corporate income available for dividends and surplus, amounting for the year ended December 31, 1921, to $39,331,662, made 1921 the best year in the company's history with the exception of 1919, in which year the net corporate income was $43,098,658. This means that the Santa Fe must be awarded the distinction of being one of the first large systems to report its return to normalcy, which statement, of course, is made with due regard to the fact that the Santa Fe still has its problems of high wage costs, and that in 1921 it suffered, like all the other carriers of the country, a reduction in traffic.

The improvement which the Santa Fe showed in 1921 as compared with 1920 is not particularly marked. This is about what is to have been expected, for the simple reason that the system did not at any time lose as much ground as was the case with practically every other carrier in the country. In other words, the Santa Fe has not had as long a distance to travel to restore its net to its standard return level. The Atchison, Topeka & Santa Fe was one of the very few carriers of the country which earned for the Railroad Administration its compensation during the 26 months of federal control. For that period its standard return was about $95,000,000. Its net after rentals for that period, however, was $98,919,277. This is the outstanding feature which must be borne in mind in analyzing Santa Fe operating results.

In 1921 the system had a net after rentals of $41,268,307 as compared with $37,380,591 in 1920, an increase of $3,887,717. The 1921 results were not quite as good as were obtained during the federal control period; in 1918 the figure was $44,206,339; in 1919, $42,025,618. Presumably, if the road had had more traffic in 1921, it would have exceeded its federal control record.

The business handled in 1921 was less than in 1920. The total tonnage for the year was 29,059,538 as compared with 36,850,553 in 1920. Reductions were made in almost all commodities with the exception of wheat, concerning which more will be noted below. The actual reduction in ton-miles was 17.64 per cent. The freight revenues naturally were not reduced in the same proportion because of the increased rate per ton-mile. The freight earnings were $160,217,450 or $8,254,679 less than in 1920. The total operating revenues were $228,925,070 or $25,323,932 less than in 1920. The operating expenses totaled $173,217,915, a reduction of $31,484,224 as against the 1920 figure. There was a reduction of $8,387,514 in maintenance of way; of $5,902,986 in maintenance of equipment and of $18,231,691 in transportation.

Large Credit Per Diem Balance

The Santa Fe is fortunate in the matter of equipment. In 1921 it had a net credit for equipment rents of $1,165,608 as against $897,998 in 1920, which item further improved its net railway operating income. During 1921 the road acquired 50 locomotives and 3,459 freight cars, etc. On the other hand, it retired 79 locomotives and 1,373 cars. At present its percentage of bad order cars is one of the lowest for any road, which indicates a favorable condition of equipment maintenance.

Views on the Gulf, Colorado & Santa Fe

The Gulf, Colorado & Santa Fe

One of the most interesting developments during the year was the change in the fortunes of the Gulf, Colorado & Santa Fe, the system's line to Galveston, and the results of which are included in the totals given above. This part of the Santa Fe has a mileage of 1,908. It has a standard re-

turn of $2,828,218, which it did not quite earn during the period of federal control. In 1920, however, it had the poor fortune to have a deficit after rentals of $1,072,202. In 1921 it accomplished the spectacular by bringing into the system a net after rentals of $6,339,396. This reflects the prosperity of the southwest, if nothing else, but the increase in net was primarily due to the manner in which the grain movement from the central west was directed towards the gulf ports and particularly Galveston.

It will be remembered that the car loadings of grain in 1921 were considerably in excess of those for 1920. This was due, for one thing, to the fact that a large part of the 1920 crop moved in the early months of 1921. Further than that, the movement was directed towards the gulf ports rather more than towards the east as had been the tendency in the past. All of the lines serving the ports along the gulf will show this same increase in grain movement and naturally, because of its position and affiliations, the Gulf, Colorado & Santa Fe was in a specially advantageous situation.

As a matter of fact, it will be found that the Gulf, Colorado & Santa Fe is one of the very few railroads of the country which showed a higher total of net ton-miles in 1921 than it did in 1920. The actual figure of net ton-miles, including revenue and non-revenue freight, was 2,012,101 as compared with 1,784,350 in 1920. We believe this is the only important Class I railroad which showed a similar result. The effect on gross earnings can be readily appreciated. Combined with the reductions which were made through economies in operation, reduced wages, etc., it is not hard to explain the reason for the great increase in net as shown.

The situation of the Texas lines or the Texas subsidiaries of the large systems in the west and southwest has always been an interesting problem of American railroading. The Gulf, Colorado & Santa Fe, as a subsidiary of the Atchison, Topeka & Santa Fe, has been no exception. An analysis of the figures of the other Texas lines will show that they also succeeded in 1921 in returning to the parent companies sizable net income and in most cases much in excess of that for 1920. While it is true that the grain movement in 1921 was a development singular to that year, the other changes in traffic and operation which have taken place because of the development of the states of Texas and Oklahoma have apparently put an entirely new aspect on the situation which will be watched in future months with great interest.

The Gulf, Colorado & Santa Fe is a real part of the Atchison, Topeka & Santa Fe System. It will be found to have the same excellent standards as the parent company, and the illustrations which are given of Gulf, Colorado & Santa Fe track will presumably be studied with interest.

The Corporate Net Income

The Santa Fe's corporate net available for dividends in 1921—$39,331,662—was, as noted above, the best in the company's history with the exception of one year, 1919. The company's dividends are at the rate of 5 per cent on the preferred stock—$6,208,685—and 6 on the common, making $13,518,420 or a total for dividends of not quite $20,000,000. In 1921, in other words, the corporate net was equal to double the amount required for dividend payments, as in fact has been the case for a long period of years. It is further worth noting that interest on bonds in 1921 was only $11,953,002, which amount is less than it was in 1907; in 1912 bond interest approached $14,000,000. Figures of this kind give one a ready picture of the Santa Fe's remarkable financial position. They indicate further how extremely favorably situated the road will be with reviving traffic.

In 1919 the company's corporate net available for dividends totaled $43,098,658. This high figure for 1919 is of more than ordinary interest, for it was the unusual for a road to increase its corporate net while it was being operated by the government at a certain rental. The reason for the improved corporate net in 1919 in the Santa Fe's case was "Other Income"; namely interest and dividends on securities owned in companies the transactions of which are not included in the system accounts and similar income. Unfortunately, the Santa Fe does not give its stockholders further details concerning this factor. At any rate, in 1918 this other income totaled $4,310,952; in 1919 it was suddenly increased to $15,100,116, which great increase was explained at the time by the meagre statement that: "The income account in this respect does not reflect a normal year's showing but constitutes a record of income credits, applying in part to prior years, received or determined during the year." The other income in 1920 was $9,842,116, and in 1921 but $5,293,888, which again emphasizes the favorable character of the 1921 railway operating results.

ATCHISON, TOPEKA & SANTA FE SYSTEM

Comparison of Operating Results

	1921	1920	Increase or decrease
Mileage	11,678	11,584	94
Operating Revenues:			
Freight	$160,217,450	$168,472,129	—$8,254,679
Passenger	52,594,551	63,473,165	—10,878,614
Mail, express and miscellaneous	16,113,069	22,303,707	— 6,190,638
Total operating revenues.	$228,925,070	$254,249,002	—$25,323,932
Operating Expenses:			
Maintenance of way and structures	$31,734,122	$40,121,636	—$8,387,514
Maintenance of equipment	52,472,941	58,375,927	— 5,902,986
Traffic	3,748,700	3,173,385	575,315
Transportation, rail line	80,283,618	98,515,309	—18,231,691
General	5,425,602	5,216,198	209,404
Total operating expenses.	$173,217,915	$204,702,139	—$31,484,224
Net operating revenue	$55,707,154	$49,546,863	$6,160,292
Railway tax accruals	14,836,268	12,004,141	2,832,128
Uncollectible railway revenues	77,318	50,435	26,883
Railway operating income.	$40,793,568	$37,492,287	$3,301,281
Equipment rents—Net—Credit	1,165,608	897,998	267,611
Joint facility rents—Net debit	690,869	1,009,694	—318,825
Net railway operating income	$41,268,307	$37,380,591	$3,887,717

Note—The operating expenses reported above exclude maintenance equalization charges and credits, so as to reflect actual expenditures applicable to each year.

The Matter of Equalization Charges

The Santa Fe in 1920 included in its maintenance expenses certain so-called equalization charges amounting to a total of $13,374,976 "for the purpose of approximating the amount of maintenance expenses to which the company was entitled under the Transportation Act." The charge was shown in an item under maintenance of way and structures as "Equalization-Way and Structures, $8,711,056," and under maintenance of equipment as "Equalization-Equipment, $4,663,919." In the 1921 income account there appears an item of $2,612,564, "equalization charges four months ending December 31, 1920, and offsetting credit in 1921." With reference to this item the report states:

"In the last annual report reference was made to the setting up of an equalization reserve for maintenance of way and structures and maintenance of equipment for the purpose of approximating the amount of the maintenance expenditures to which the company was entitled under the Transportation Act. This practice was carried over into the year 1921, but owing to the great difficulty of definitely determining a monthly proportion of the normal amount of annual expenditures under the fluctuating conditions which subsequently developed, the practice was discontinued and under instructions of the Interstate Commerce Commission the unexpended balance in the reserve was written off by credits to operating expenses during the remainder of the year. This has resulted in an abnormal credit to the income of the current year of $2,612,564, being the portion of the reserve applicable to the four months ending December 31, 1920. The remainder of the reserve, viz., $10,762,412, which pertained to the guaranty period, while credited to the current expenses, is offset by a charge to income of a corresponding amount as an adjustment of the amount due under Section 209 of Transportation Act, 1920."

General News Department

The American Association of Passenger Traffic Officers will hold its annual meeting at the Seelbach Hotel, Louisville, Ky., on Tuesday and Wednesday, October 10 and 11.

Wage Reduction for Shop Men to Be Announced Soon

The Labor Board's decision regarding the reductions to be made in the wages of shopmen has been completed and will be announced as soon as a dissenting opinion which will be signed by the three labor members on the board has been completed. Unauthorized reports indicate that the scale of reductions for shopmen will range from 5 to 9 cents per hour, the wages of apprentices and laborers to be cut 5 cents an hour, of mechanics and passenger carmen 7 cents an hour and of freight carmen 9 cents an hour. The leaders of the sixteen railroad unions have been requested by E. H. Fitzgerald, president of the clerk's organization, to meet in Cincinnati on June 6 to discuss the future attitude and action of the organization as the result of the recent orders of the Board.

Election on the Pennsylvania

Clerks and miscellaneous employees of the Pennsylvania Railroad have recently completed their second election, by secret ballot, for representatives on the joint committee which deals with the officers of the road in questions of mutual concern. They were to fill vacancies and the places of representatives whose term of office expires this year. Approximately 15,000 employees in the Eastern Region were concerned in the elections. The results indicate that the plan is working with increasing satisfaction. The spirit in which the elections were carried on gives evidence of keen interest on the part of the employees. For the 72 places, 120 candidates were nominated. The number of candidates for each office varied from one to seven. Candidates were nominated by petition and the ballots were counted by tellers representing the employees and the management; and the results were certified by the Regional Joint Committees.

President Harding Endorses Careful Crossing Campaign

The American Railway Association publishes the following statement issued by President Warren G. Harding relative to the four months' campaign for safety at highway crossings:

"The complete success of such an effort would mean the saving of thousands of lives, the prevention of many more thousands of injuries and, incidentally, the prevention of a great property loss. Of course, the ideal solution is elimination of grade crossings, to which all possible energy and means should be unceasingly directed. But the extent of our country and its railroad mileage make apparent that not for many years of utmost effort could this be affected. There should be constant pressure for elimination of these danger spots, particularly in the more populous areas; pending which there is need for just the kind of preventive effort that your association is planning. Among these measures, the most effective would seem to be to arouse in the minds of drivers a sense of their personal responsibilities. When thoughtlessness is allowed to usurp the place of vigilance, as too often happens, the scene is set for tragedy. Reminders and still more reminders of the need for caution at railway crossings are needed.

"Surely, the effort you are undertaking is appealing and it ought to have the most generous and general support."

Preliminary Report of April Earnings

A preliminary compilation of reports just received by the Interstate Commerce Commission from 137 Class I railroads show that in April those roads had a net operating income of $35,239,000, compared with $21,886,000 during the same month last year.

Total operating revenues for the 137 railroads amounted to $297,300,000, a decrease of 4.6 per cent compared with April, 1921, while their operating expenses totaled $240,533,000, or a reduction of 11 per cent, compared with the same month one year ago. The roads from which reports have already been received represent a mileage of 169,586 miles.

Reports from 66 railroads in the Eastern district showed that their operating revenues in April totaled $150,897,000, a decrease of 3.8 per cent, while their operating expenses totaled $120,489,000, a reduction of 10.6 per cent under April, 1921. The net operating income for those 66 roads totaled $19,931,800, compared with $12,671,900.

Reports from 19 roads in the Southern district showed that their total operating revenues were $29,524,400, an increase of only two-tenths of 1 per cent, while their operating expenses amounted to $23,004,700, which was a decrease of 13.4 per cent. The net operating income of those 19 roads in April totaled $4,748,400, compared with $1,338,600 in April one year ago.

Fifty-two railroads in the Western district had operating revenues totaling $116,878,400, which was a decrease of 6.7 per cent, while the operating expenses of those same roads totaled $97,039,300, a reduction of 11 per cent. The net operating income of those roads totaled $10,559,300, compared with $7,875,500.

Complete reports for the Class I railroads of the country are expected to be available late this week.

A Safety Message by Radio

Of the various editors of "safety first" news in this country one of the best is the Insurance Department of the Pennsylvania Railroad; and a brief message from this source was sent out by radio telephone on the evening of May 17 from the Westinghouse broadcasting stations in Pittsburgh, Chicago, Newark, N. J., and Springfield, Mass. Some of the things said were the following:

During the last 10 years 84,000 people have been killed and injured in this country while trespassing or walking on railroad tracks and trains; and 9,000 of this great army of killed and injured were children under 14 years of age; 12,000 were between 14 and 21 years; 9,000 were hoboes and tramps and 54,000 were useful members of society. Notwithstanding the unavoidable hazards of railroad operation nearly one-half of all the fatal injuries that occur on the railroads is chargeable to trespassing. This needless waste of human life is a sad reflection upon the intelligence of the American people; it will be stopped when public spirited citizens in every town become awakened.

Indeed, great improvement has already been made. Prior to 1916 trespassers killed and injured on the railroads numbered about 10,000 a year, but during the last three years this has been reduced to an average of about 5,000 a year, notwithstanding a large increase in population and in railroad business. This great result, preventing untold suffering, is directly due to safety education in the home, the schools, the mines, the manufacturing enterprises and to the general influence of the safety first movement; and particularly to the untiring efforts put forth by the railroads through their police departments to keep persons off the tracks. Teachers, preachers, and all public-spirited citizens are urged to use their influence in securing attention to the simple rules many times published [and quoted in the message].

Grand Trunk Rally at Stratford

At Stratford, Ontario, on the evening of May 18, about 2,200 employees of the Grand Trunk Railway participated in a grand re-union in the Stratford Armory; and about 800 others, unable to get into the building, held an overflow meeting at the Avon Casino. Sir Joseph Flavelle, chairman of the board of directors, W. D. Robb, vice-president, and other prominent officers of the road were present, and there was a brief address by Chair-

man Flavelle. Superintendent W. J. Piggott was chairman of the meeting.

A bronze tablet, in memory of employees who gave their lives in the Great War, was unveiled, and an ambulance, presented to the railway company, for use in Stratford, by an association of employees, was on exhibition. The presentation of medals and other trophies as rewards in athletic and other contests also formed a feature of the meeting.

Stratford is the location of large shops of the company and employees in the shops and other departments of the service presented a musical and literary program.

Program of the Mechanical Division Convention

The program of the third annual meeting of Division V—Mechanical—of the American Railway Association, which will be held at Atlantic City, N. J., June 14-21 inclusive, is as follows:

First day (Wednesday, June 14, 1922)—Opening exercises; association business; discussion of reports of the following committees: Nominations, Safety Appliances and Scheduling of Equipment through Repair Shops.

Second day—Discussion of reports on Prices for Labor and Material, Arbitration, Tank Cars, Loading Rules, Train Lighting and Equipment.

Third day—Discussion of reports on Car Construction, Couplers and Draft Gears, Brake Shoe and Brake Beam Equipment, Train Brake and Signal Equipment, and Car Wheels.

Fourth day (Monday, June 19, 1922)—Discussion of reports on the Manual, Specifications and Tests for Materials, and Locomotive Headlights and Classification Lamps; election of officers.

Fifth day—Discussion of reports on Locomotive Construction, Feed Water Heaters, and Modernization of Stationary Boiler Plants.

Sixth day—Discussion of the report on the Design and Maintenance of Locomotive Boilers; topical discussion; Closing Exercises.

No reports will be received from the following committees: Autogenous and Electric Welding; Design, Maintenance and Operation of Electric Rolling Stock; Engine Terminals, Design and Operation; Lateral Motion on Locomotives; Mechanical Stokers; Standard Blocking for Cradles of Car Dumping Machines; Train Resistance and Tonnage Rating; and Car Repair Shop Layouts.

Lumber Standardization Proposed

Representatives of the American Railway Association, the American Electric Railway Association, and the wood manufacturing industries met with manufacturers, wholesalers and distributors of lumber, architects and building engineers at the Department of Commerce in Washington on May 26, and concurred in the decision previously arrived at by the last named groups regarding the subjects of standardization of lumber sizes, simplification of grades, guaranties of quantity and quality and national inspection.

It was resolved:

"That all organizations representing producers, distributors and consumers of lumber, be invited to appoint representatives to meet in general conference on the call of the National Lumber Manufacturers' Association, with the assistance of the departments of Commerce and Agriculture, for the purpose of arranging for holding meetings in as many sections of the United States as may be deemed necessary in order to arrive at definite recommendations concerning the three subjects here under discussion. Such recommendations to be placed before another general conference of all interests involved after the series of sectional conferences shall have been concluded."

Another resolution which was adopted included national inspection in the matters to be brought before this committee. It is intended to proceed expeditiously with the creation of this committee and it may be able to hold its first meeting within 30 days.

W. F. Kiesel, Jr., (P. R. R.) speaking for the American Railway Association, said that his association was in entire accord with the proposed lumber trade reforms, in all the fundamentals.

V. R. Hawthorne, secretary of the mechanical division A. R. A., endorsed Mr. Kiesel's statement; the association had for a number of years devoted much attention to the problems of standardization and simplification.

F. Tingley, Washington, representing the American Electric Railway Association, pledged the co-operation of that organization.

Mechanical Division Issues Manual of Standard and Recommended Practice

The standard and recommended practice of the former American Railway Master Mechanics' and Master Car Builders' Associations has been consolidated and harmonized by appropriate committees of the Mechanical Division, American Railway Association, and together with practices adopted since amalgamation with the American Railway Association incorporated in a loose-leaf volume, designated "Manual of Standard and Recommended Practice, Mechanical Division, American Railway Association." This work has been done under the direction of the Committee on Manual.

This manual contains text and drawings for all standards and recommended practice adopted by letter ballot by the former Master Car Builders' and American Railway Master Mechanics' Associations and the Mechanical Division, American Railway Association, and is arranged in 12 sections, as follows:

A—Specifications for Materials.
B—Gages and Testing Devices.
C—Car Construction—Fundamentals and Details.
D—Car Construction—Trucks and Truck Details.
E—Brakes and Brake Equipment.
F—Locomotive Wheels, Tires and Miscellaneous Locomotive Standards.
G—Safety Appliances for Cars and Locomotives.
H—Train Lighting, Headlights and Classification Lamps.
I—Rules for Fuel Economy on Locomotives.
J—Inspection and Testing of Locomotive Boilers and Rules and Instructions for Inspection and Testing of Steam Locomotives and Tenders.
K—Specifications for Tank Cars.
L—Miscellaneous Standards and Recommended Practice.

The pages in each of these sections are numbered consecutively and each section is provided with separate index. There is also a general index of the contents of the entire manual with proper reference to section and page.

The Code of Rules Governing the Condition of and Repairs to Freight and Passenger Cars for the Interchange of Traffic, and the Rules Governing the Loading of Lumber, Logs, Stone, etc., and Loading and Carrying of Structural Materials, Plates, Rails, Girders, etc., while adopted standards are not published in this manual.

The manual contains nearly 1,000 pages of text and drawings and is bound in special hinged back binder, so that it may be kept up to date by issuing from time to time corrected pages without the necessity of printing the entire book. It will also be possible to secure separate sheets covering only such matter as is desired without the necessity of purchasing the entire book.

This manual will be supplied on requisition at the following prices:

To members of the association:

Manual complete, including binder, per copy	$6.00
Separate sections complete, self-covered in paper, per copy	.50
Separate sheets, each	.05

To other than members of the association the manual is sold at double the prices quoted.

Meetings and Conventions

The following list gives names of secretaries, dates of next or regular meetings and places of meetings:

AIR BRAKE ASSOCIATION.—F. M. Nellis, 165 Broadway, New York City. Next convention, June 19-21, Hadden Hall Hotel, Atlantic City, N. J. Exhibit by Air Brake Appliance Association.

AIR BRAKE APPLIANCE ASSOCIATION.—J. F. Gettrust, The Ashton Valve Company, 318 W. Washington St., Chicago. Meeting with Air Brake Association.

AMERICAN ASSOCIATION OF DEMURRAGE OFFICERS.—F. A. Pontious, Supervisor of Demurrage and Storage, C. & N. W. Ry., Chicago.

AMERICAN ASSOCIATION OF DINING CAR SUPERINTENDENTS.—L. A. Stone, C. & E. I. Ry., Chicago. Annual meeting, Oct. 17-20, San Francisco, Cal.

AMERICAN ASSOCIATION OF ENGINEERS.—C. E. Drayer, 63 E. Adams St., Chicago.

AMERICAN ASSOCIATION OF GENERAL BAGGAGE AGENTS.—E. L. Duncan, 332 So. Michigan Ave., Chicago. Next meeting, June 28 and 29, Minneapolis, Minn.

AMERICAN ASSOCIATION OF PASSENGER TRAFFIC OFFICERS.—W. C. Hope, C. R. R. of N. J., 143 Liberty St., New York. Annual meeting, October 10 and 11, Seelbach Hotel, Louisville, Ky.

AMERICAN ASSOCIATION OF RAILROAD SUPERINTENDENTS.—J. Rothschild, Room 400, Union Station, St. Louis, Mo. Next convention, August 23-25, 1922, Kansas City, Mo.

AMERICAN ELECTRIC RAILWAY ASSOCIATION.—J. W. Welsh, 8 W. 40th St., New York.

AMERICAN RAILROAD MASTER TINNERS', COPPERSMITHS' AND PIPE FITTERS' ASSOCIATION.—C. Borcherdt, 202 North Hamlin Ave., Chicago, Ill.

AMERICAN RAILWAY ASSOCIATION.—J. E. Fairbanks, General Secretary, 75 Church St., New York, N. Y. Annual meeting, November, 1922.

Division I—Operating.

Freight Station Section (including former activities of American Association of Freight Agents). R. O. Wells, Freight Agent, Illinois Central Railroad, Chicago, Ill.

Medical and Surgical Section. J. C. Caviston, 75 Church St., New York.

Protective Section (including former activities of the American Railway Chief Special Agents and Chiefs of Police Association). J. C. Caviston, 75 Church St., New York, N. Y.

Telegraph and Telephone Section (including former activities of the Association of Railway Telegraph Superintendents). W. A. Fairbanks, 75 Church St., New York, N. Y. Annual meeting, September 20-22, 1922, Colorado Springs, Colo.

Safety Section. J. C. Caviston, 75 Church St., New York.

Division II—Transportation (including former activities of the Association of Transportation and Car Accounting Officers). G. W. Covert, 431 South Dearborn St., Chicago, Ill.

Division III—Traffic, J. Gottschalk, 143 Liberty St., New York.

Division IV—Engineering, E. H. Fritch, 431 South Dearborn St., Chicago, Ill. Exhibit by National Railway Appliances Association.

Construction and Maintenance Section. E. H. Fritch.

Electrical Section. E. H. Fritch.

Signal Section (including former activities of the Railway Signal Association). H. S. Balliet, 75 Church St., New York, N. Y. Next meeting, March 13 and 14, Drake Hotel, Chicago. Annual meeting, June 14-16, 1922, Monmouth Hotel, Spring Lake, N. J.

Division V—Mechanical (including former activities of the Master Car Builders' Association and the American Railway Master Mechanics' Association). V. R. Hawthorne, 431 South Dearborn St., Chicago, Ill. Annual convention, June 14-21, 1922, Atlantic City, N. J. Exhibit by Railway Supply Manufacturers' Association.

Equipment Painting Section (including former activities of the Master Car and Locomotive Painters' Association). V. R. Hawthorne, 431 South Dearborn St., Chicago, Ill.

Division VI—Purchases and Stores (including former activities of the Railway Storekeepers' Association). J. P. Murphy, General Store Keeper, New York Central, Collinwood, Ohio. Annual meeting, June 19-21, 1922, Hotel Traymore, Atlantic City, N. J.

Division VII—Freight Claims (including former activities of the Freight Claim Association). Lewis Pilcher, 431 South Dearborn St., Chicago, Ill.

AMERICAN RAILWAY BRIDGE AND BUILDING ASSOCIATION.—C. A. Lichty, C. & N. W. Ry., 319 N. Waller Ave., Chicago. Next convention, October 17-19, 1922, Cincinnati, Ohio. Exhibit by Bridge and Building Supply Men's Association.

AMERICAN RAILWAY DEVELOPMENT ASSOCIATION.—A. Leckie, Industrial Agent, Kansas City Southern Ry., Kansas City, Mo.

AMERICAN RAILWAY ENGINEERING ASSOCIATION.—(Works in co-operation with the American Railway Association, Division IV.) E. H. Fritch, 431 South Dearborn St., Chicago. Exhibit by National Railway Appliances Association.

AMERICAN RAILWAY MASTER MECHANICS' ASSOCIATION.—(See American Railway Association, Division V.)

AMERICAN RAILWAY TOOL FOREMEN'S ASSOCIATION.—R D. Fletcher, 1145 East Marquette Road, Chicago. Exhibit by Supply Association of the American Railway Tool Foremen's Association.

AMERICAN SHORT LINE RAILROAD ASSOCIATION.—T. F. Whittelsey, Union Trust Bldg., Washington, D. C. Annual meeting, May 10, Washington, D. C.

AMERICAN SOCIETY FOR STEEL TREATING.—W. H. Eiseman, 1600 Prospect Ave., Cleveland, Ohio. Annual convention, Oct. 2-7, 1922, General Motors Building, Detroit, Mich.

AMERICAN SOCIETY FOR TESTING MATERIALS.—C. L. Warwick, University of Pennsylvania, Philadelphia, Pa. Annual meeting, June 26-30, 1922, Chalfonte-Haddon Hall, Atlantic City, N. J.

AMERICAN SOCIETY OF CIVIL ENGINEERS.—E. M. Chandler (acting secretary), 33 W. 39th St., New York. Regular meetings 1st and 3d Wednesdays in month, except July and August, 33 W. 39th St., New York.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS.—Calvin W. Rice, 29 W. 39th St., New York.

Railroad Division—A. F. Stuebing, Manager Editor, Railway Mechanical Engineer, Woolworth Bldg., New York.

AMERICAN TRAIN DISPATCHERS ASSOCIATION.—C. L. Darling, 1310-1311 Mallers Bldg., Chicago, Ill. Next convention, June 18, 1923, Chicago.

AMERICAN WOOD PRESERVERS' ASSOCIATION.—S. D. Cooper, A. T. & S. Fe R. R., Topeka, Kan. Next meeting, January 23, 1923, New Orleans, La.

ASSOCIATION OF RAILWAY CLAIM AGENTS.—H. D. Morris, Northern Pacific R. R., St. Paul, Minn.

ASSOCIATION OF RAILWAY ELECTRICAL ENGINEERS.—Jos. A. Andreucetti, C. & N. W., Room 411, C. & N. W. Sta., Chicago. Next meeting, June 19, Dennis Hotel, Atlantic City, N. J. Exhibit by Railway Electrical Supply Manufacturers' Association.

ASSOCIATION OF RAILWAY EXECUTIVES.—Thomas De Witt Cuyler (chairman), 61 Broadway, New York, N. Y.

ASSOCIATION OF RAILWAY SUPPLY MEN.—A. W. Clokey, 1658 McCormick Bldg., Chicago. Meeting with International Railway General Foremen's Association.

ASSOCIATION OF RAILWAY TELEGRAPH SUPERINTENDENTS.—(See American Railway Association, Division I.)

ASSOCIATION OF TRANSPORTATION AND CAR ACCOUNTING OFFICERS.—(See American Railway Association, Division II.)

BRIDGE AND BUILDING SUPPLY MEN'S ASSOCIATION.—D. J. Higgins, American Valve & Meter Company, 332 S. Michigan Ave., Chicago. Meeting with convention of American Railway Bridge and Building Ass'n.

CANADIAN RAILWAY CLUB.—W. A. Booth, 53 Rushbrook St., Montreal, Que.

CAR FOREMEN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 626 North Pine Ave., Chicago. Regular meetings, 2d Monday in month, except June, July and August, New Morrison Hotel, Chicago.

CAR FOREMEN'S ASSOCIATION OF ST. LOUIS, MO.—Thomas B. Koeneke, 604 Federal Reserve Bank Bldg., St. Louis, Mo. Meetings, first Tuesday in month at the American Hotel Annex, St. Louis.

CENTRAL RAILWAY CLUB.—Harry D. Vought, 26 Cortlandt St., New York. Regular meetings, 2d Thursday in January, March, May, September and November, Hotel Iroquois, Buffalo, N. Y.

CHIEF INTERCHANGE CAR INSPECTORS' AND CAR FOREMEN'S ASSOCIATION.—W. P. Elliott, Terminal Railroad Association of St. Louis, East St. Louis, Ill.

CHIEF INTERCHANGE CAR INSPECTORS' AND CAR FOREMEN'S SUPPLY MEN'S ASSOCIATION.—D. B. Wright, 34th St. and Artesian Ave., Chicago, Ill. Meeting with Chief Interchange Car Inspectors' and Car Foremen's Association.

CINCINNATI RAILROAD CLUB.—W. C. Cooder, Union Central Bldg., Cincinnati, Ohio. Meetings, 2d Tuesday in February, May, September and November.

EASTERN RAILROAD ASSOCIATION.—E. N. Bessling, 614 F St., N. W., Washington, D. C.

FREIGHT CLAIM ASSOCIATION.—(See American Railway Association, Division VII.)

GENERAL SUPERINTENDENTS' ASSOCIATION OF CHICAGO.—C. H. Treichel, Grand Central Station, Chicago. Regular meetings, Wednesday preceding 3d Friday in month, Room 1414, Manhattan Bldg., Chicago.

INTERNATIONAL RAILROAD MASTER BLACKSMITHS' ASSOCIATION.—W. J. Mayer, Michigan Central R. R., Detroit, Mich. Annual convention, August 15-17, Hotel Sherman, Chicago. Exhibit by International Railroad Master Blacksmiths' Supply Men's Association.

INTERNATIONAL RAILROAD MASTER BLACKSMITHS' SUPPLY MEN'S ASSOCIATION. George P. White, 747 Railway Exchange, Chicago. Meeting with International Railroad Master Blacksmiths' Association.

INTERNATIONAL RAILWAY FUEL ASSOCIATION.—J. G. Crawford, 702 E. 51st St., Chicago. Exhibit by International Railway Supply Men's Association.

INTERNATIONAL RAILWAY GENERAL FOREMEN'S ASSOCIATION.—Wm. Hall, 1061 W. Wabasha Ave., Winona, Minn.

INTERNATIONAL RAILWAY SUPPLY MEN'S ASSOCIATION.—C. W. Sullivan, Garlock Packing Co., 326 W. Madison St., Chicago. Meeting with International Railway Fuel Association.

MASTER BOILER MAKERS' ASSOCIATION.—Harry D. Vought, 26 Cortlandt St., New York.

MASTER CAR AND LOCOMOTIVE PAINTERS' ASSOCIATION.—(See A. R. A., Division V.)

MASTER CAR BUILDERS' ASSOCIATION.—(See A. R. A. Division V.)

NATIONAL ASSOCIATION OF RAILWAY TIE PRODUCERS.—Warren C. Nixon, Western Tie & Timber Co., 905 Syndicate Trust Bldg., St. Louis, Mo.

NATIONAL ASSOCIATION OF RAILWAY AND UTILITIES COMMISSIONERS.—James B. Walker, 49 Lafayette St., New York. Next convention, September 26, 1922, Detroit, Mich.

NATIONAL FOREIGN TRADE COUNCIL.—O. K. Davis, 1 Hanover Square, New York.

NATIONAL RAILWAY APPLIANCE ASSOCIATION.—C. W. Kelly, People's Gas Bldg., Chicago. Annual exhibition at convention of American Railway Engineering Association.

NEW ENGLAND RAILROAD CLUB.—W. E. Cade, Jr., 683 Atlantic Ave., Boston, Mass. Regular meetings, 2d Tuesday in month, excepting June, July, August and September.

NEW YORK RAILROAD CLUB.—Harry D. Vought, 26 Cortlandt St., New York. Regular meetings, 3d Friday in month, except June, July and August, at 29 W. 39th St., New York.

PACIFIC RAILWAY CLUB.—W. S. Wollner, 64 Pine St., San Francisco, Cal. Regular meetings, 2d Thursday in month, alternately in San Francisco and Oakland.

RAILWAY ACCOUNTING OFFICERS' ASSOCIATION.—E. R. Woodson, 1116 Woodward Building, Washington, D. C. Annual meeting, June 7, 1922, Hotel Cleveland, Cleveland, Ohio.

RAILWAY BUSINESS ASSOCIATION.—Frank W. Noxon, 600 Liberty Bldg., Broad and Chestnut Sts., Philadelphia, Pa. Annual dinner, February 1, Waldorf-Astoria, New York.

RAILWAY CLUB OF PITTSBURGH.—J. D. Conway, 515 Grandview Ave., Pittsburgh, Pa. Regular meetings, 4th Thursday in month, except June, July and August, Fort Pitt Hotel, Pittsburgh, Pa.

RAILWAY DEVELOPMENT ASSOCIATION.—(See Am. Ry. Development Assn.)

RAILWAY ELECTRICAL SUPPLY MANUFACTURERS' ASSOCIATION.—J. Scribner, General Electric Co., Chicago. Annual meeting with Association of Railway Electrical Engineers.

RAILWAY EQUIPMENT MANUFACTURERS' ASSOCIATION.—R. J. Himmelright, 17 East 42nd St., New York. Meeting with Traveling Engineers' Association.

RAILWAY FIRE PROTECTION ASSOCIATION.—R. R. Hackett, Baltimore & Ohio R. R., Baltimore, Md.

RAILWAY REAL ESTATE ASSOCIATION.—R. H. Morrison, C. & O. Ry., Richmond, Va. Next meeting October 10-13, 1922, Pittsburgh, Pa.

RAILWAY SIGNAL ASSOCIATION.—(See A. R. A., Division IV., Signal Section.)

RAILWAY STOREKEEPERS' ASSOCIATION.—(See A. R. A., Division VI.)

RAILWAY SUPPLY MANUFACTURERS' ASSOCIATION.—J. D. Conway, 1841 Oliver Bldg., Pittsburgh, Pa. Meeting with A. R. A., Division V.

RAILWAY TELEGRAPH AND TELEPHONE APPLIANCE ASSOCIATION.—G. A. Nelson, 30 Church St., New York.

RAILWAY TREASURY OFFICERS' ASSOCIATION.—L. W. Cox, Commercial Trust Bldg., Philadelphia, Pa.

ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION.—P. J. McAndrews, C. & N. W. Ry., Sterling, Ill. Annual convention, September, 19-21, 1922, Hotel Statler, Cleveland, Ohio. Exhibit by Track Supply Association.

ST. LOUIS RAILWAY CLUB.—B. W. Frauenthal, Union Station, St. Louis, Mo. Regular meetings, 2d Friday in month, except June, July and August.

SIGNAL APPLIANCE ASSOCIATION.—F. W. Edmunds, Sunbeam Electric Manufacturing Company, New York City. Meeting with American Railway Association, Signal Section.

SOUTHERN AND SOUTHWESTERN RAILWAY CLUB.—A. J. Merrill, P. O. Box 1205, Atlanta, Ga. Regular meetings, 3d Thursday in January, March, May, July, September and November, Piedmont Hotel, Atlanta.

SOUTHERN ASSOCIATION OF CAR SERVICE OFFICERS.—J. L. Carrier, Car Serv. Agt., Tenn. Cent. Ry., 319 Seventh Ave., North Nashville, Tenn. Next meeting, October 19, St. Augustine, Fla.

SUPPLY ASSOCIATION OF AMERICAN RAILWAY TOOL FOREMEN'S ASSOCIATION.—H. S. White, 9 N. Jefferson St., Chicago.

TRACK SUPPLY ASSOCIATION.—W. C. Kidd, Ramapo Iron Works, Hillburn, N. Y. Meets with Roadmasters' and Maintenance of Way Association.

TRAVELING ENGINEERS' ASSOCIATION.—W. O. Thompson, 1177 East 98th St., Cleveland, Ohio. Annual convention, September 12-15, Hotel Sherman, Chicago. Exhibit by Railway Equipment Manufacturers' Association.

WESTERN RAILWAY CLUB.—Bruce V. Crandall, 14 E. Jackson Boulevard, Chicago. Regular meetings, 3d Monday each month except June, July and August.

Traffic News

The State Department has communicated to the Canadian government its willingness to begin negotiations in connection with the St. Lawrence Canal project, the governments of the United States and Canada having on January 21, 1920, referred to the International Joint Commission for investigation and report all questions relating to the importance of the St. Lawrence river between Lake Ontario and Montreal, both for navigation and the development of water power.

The railroad commission of Alabama announces that an order will be issued requiring that all intrastate freight rates which were advanced 25 per cent during the war in conformity with the order of the Interstate Commerce Commission, shall be reduced 12½ per cent on July 1, when the new interstate rates become effective. The order provides that the rates on velvet beans, velvet bean products, and mixed feed for animals and poultry must be given the same reduction. It also provides that no change shall be made in the rates on raw materials for furnaces, which the commission refused to permit the railroads to increase when the last advance was authorized.

New England Rate Decision Sustained

In the federal court at New York City on May 25 Judges Hough, Manton and Mayer denied the application of the trunk line railroads for an injunction restraining the Interstate Commerce Commission from putting into effect its order of January 30 increasing by 15 per cent the divisions allowed the New England lines on through freight.

The petitioning lines contended that the order of the commission was discriminatory and contrary to the purpose of the Interstate Commerce act. The reason for increasing the rates in behalf of the New England lines was to help them financially, and in effect the order of the commission, if executed, would take money from one group of railroads in order to aid another group.

The opinion of the court calls attention to the heavy costs of operating the New England lines because of terminal characteristics, a density of branch lines, stations, switches, yards, etc., and states that the standardization of wages on railroads by the War Labor Board had increased the cost of operation of the New England lines relatively more than other lines, and that their fuel expense was heavier than that of roads within easy reach of the coal producing territory.

It states that nothing was found in the record to justify any claim of abuse of discretion in rate making. "We are satisfied," the opinion continues, "that a reasonable investigation was made by the commission. . . ."

Coal Production

The eighth week of the coal strike opened with a decided increase in production. The returns so far received indicate an output of soft coal close to 5,000,000 tons, according to the weekly bulletin of the Geological Survey. Production of anthracite, however, remains practically zero.

Final reports for the seventh week of the strike (May 15-20) show an output of 4,472,000 tons of bituminous coal and 8,000 tons of anthracite, a total of 4,480,000 tons.

The increase during the week of May 22-27 may be judged from the fact that car-loadings on Monday exceeded by 652 cars the highest figure previously reported since the strike began. An increase on Tuesday carried loadings above the 15,000 mark.

NUMBER OF CARS LOADED, BY DAYS

	1st Week	3d Week	5th Week	7th Week	8th Week
Monday	11,445	7,898	11,598	13,366	14,688
Tuesday	11,019	10,041	12,160	12,830	15,026
Wednesday	11,437	11,088	12,861	13,422	14,684
Thursday	11,090	11,193	12,487	13,445	14,612
Friday	11,296	11,596	12,778	14,036	.....
Saturday	8,888	10,194	11,265	12,357	.....

The increase is said to be largely in response to higher prices and more active demand, calling into production mines which have hitherto been working only part-time in the districts not affected by the strike.

Commission and Court News

Interstate Commerce Commission

The commission has suspended from June 1 until September 29 the operation of schedules, which propose increases in rates of 3 cents per 100 pounds on grain products, carloads, from Montana points to various California points.

The commission has suspended until September 23, the operation of schedules which propose to increase from 75 cents per 100 lb. to $1.08 the rate on iron and steel from Utah common points to various California points.

The commission has suspended until September 29, the operation of schedules No. 21 which propose increase in minimum weight on grain and seeds, beans, peas, or pop corn in mixed carloads. At present 30,000 lb. minimum is applicable.

The commission has vacated its order in the Nebraska intrastate rate case, the Nebraska State Railway Commission having by order on May 5 set aside its order which prevented the railroads from applying the rate increases authorized by the commission in Ex Parte 74.

The commission has suspended from June 1 to September 29 the operation of schedules, which propose changes in routing of shipments of grain, grain products, cereals and cereal products, carloads, on traffic originating in Colorado, Iowa, Kansas, Missouri, Nebraska, and Wyoming, destined to Idaho, Montana, Oregon, Utah, Washington, Wyoming and British Columbia.

The commission has suspended until September 23, the operation of tariffs on dried and evaporated fruits between points in Arizona, California, Nevada, Oregon and Utah on the one hand and points in Utah, California, Wyoming, Nevada, Idaho, Montana and Oregon on the other hand which propose to increase by 25 per cent the rates on these commodities in case of failure on the part of shippers to observe proposed box specifications and requirements.

The commission has rescinded its order in the railway mail pay case of November 18, 1921, in so far as it modifies Section 8 of its order of December 23, 1919. This is now modified to provide that whenever a regular authorization is exceeded on 50 per cent or more of the trips in any calendar month the appropriate higher unit shall be authorized. This rule is never to be used in the month of December. This is in response to a joint petition of the postmaster general and the carriers.

The commission has suspended from June 1 to September 29 the operation of Southern Pacific schedules, which propose to establish proportional round trip basing fares from Long Beach, Los Angeles, Ontario, Pasadena, Pomona, Colton, Riverside and San Bernardino, California to Ogden, Utah, to be granted passengers holding or who purchase round trip excursion tickets from Ogden, Utah, to West Yellowstone, Montana.

The following will serve to illustrate the effect of the suspended fares:

Regular summer excursion fare, Los Angeles to Ogden, $48.82.
Proportional basing fare, Los Angeles to Ogden, $44.17.

The commission has issued a decision finding not justified the proposed joint proportional rates on grain and grain products from Minneapolis and other points in the Northwest to points in trunk line territory and New England which had been filed to become effective on November 1. The schedules had been suspended and are now ordered cancelled. At the time the suspended rates were originally determined upon they represented substantial reductions in the then existing rates. Subsequently the proportional rates east of Chicago were reduced by eastern lines and the proportionals west of Chicago were reduced following the commission's decision in the Western grain case. At the present time the schedules would not lower the existing combination rate on wheat and would accomplish only slight reductions in the rates on grain products and coarse grains. The re-

port says that the railroads concede that these reductions would not affect the situation very materially or afford marked relief to Minneapolis shippers who expect at some future date to propose other rates.

Conference Ruling on Creosoted Lumber

The commission has amended conference ruling 232 to read to the effect that for creosoting lumber a transit privilege of eighteen months is not excessive. The commission has heretofore expressed the view that a transit privilege extending through a period of more than one year is *prima facie* unreasonable; but experience has shown, that as applied to the creosoting of lumber a period of 24 months is not unreasonably long, provided full local rates on the inbound material are required to be paid.

Southern Freight Rate Investigation

At the hearing in the southern class rate investigation now being conducted by Commissioner Eastman at Atlanta, Ga., the commissioner has announced that hearings will be discontinued after presentation of the carriers' case, on or about June 20, until July 12, at which time opportunity will be afforded at Atlanta for cross examination of the carriers' witnesses. Subsequent hearings will be held in Atlanta, Asheville, New Orleans, Chicago and New York, for the presentation of evidence by others than the carriers. These hearings will not be held prior to September 1. Shippers and other interested parties are requested to advise the commission as to the probable amount of time they will require and as to whether they desire to present evidence as to intraterritorial and interterritorial rates at one time.

Personnel of Commissions

J. C. Roth has been promoted from assistant director, Bureau of Service, to director, Bureau of Service, Interstate Commerce Commission, effective on June 1; vice, Colonel F. G. Robbins, who has been elected vice-president of the Chicago & Erie, with headquarters at Chicago.

United States Supreme Court

Reading Dissolution Decree to be Modified

The Supreme Court on Monday directed that the decree of the district court for the eastern district of Pennsylvania, which ordered dissolution of the Reading system, be modified and the case remanded for further proceedings and hearings before the district court in conformity with the opinion. The court said the case presented the questions, first, whether a decree of the district court entered under a mandate from the Supreme Court was in accordance therewith, and, second, whether it did equity to the appellants. The court said the difficulty in the separation of interest of the Reading Company, and of the Reading Coal Company was that the lien of the general mortgage covered much of the property of the Reading Company, and all the stock and property of the coal company, and that the general mortgage was not redeemable until 1997. It said the plan required the railroad company to assume the whole liability of the general mortgage. The case had to do wholly with the method of carrying out the dissolution previously ordered.

Saying that since the time of settling the decree a change for the better has come in the financial situation of the country, Chief Justice Taft said:

"We think the plan should be changed in accord with the following suggestions. The district court should, after a hearing of all interested parties, determine the respective values of the properties of the merged Reading Co. and the coal company which are subject to lien of the general mortgage. Then the decree should direct that the liability of each on the bonds and the pledge under the mortgage shall be modified as between the mortgagee and the mortagors, so that the liability of the Reading Co. on the bonds outstanding, and the lien of the mortgage upon that company's property to secure them, shall be reduced to an amount proportionate to the ratio of the value of its pledged property to the value of all the property pledged including that of the coal company. The obligation of the coal company upon such bonds and the lien upon its property to secure them should be reduced in corresponding proportion. The amount that each company is to pay as interest should be similarly fixed and specific provisions for foreclosure of these separate liens on default and requisite machinery and other necessary changes to carry out the result will be made by the district court in its discretion. By this arrangement the interests and joint obligations of the Reading Co. and the coal company will be completely severed and the purpose of this court carried out.

"The Reading Co.'s first plan contemplated the securing of a voluntary release of the coal company's property by the bondholders through payment of 10 per cent of the par value of his bonds to each bondholder, but the proposal did not meet with favor. We leave it to the district court to determine what, if any, injury to the security this modification of the terms of the debt and mortgage may cause and to compensate for it by such a payment to the bondholders by both or either of the bondholders as may seem equitable and convenient.

"The changes involved in these suggestions may interfere with, or make inapplicable the provisions of the present plan looking to a proper working capital for the Reading Company. Authority is, therefore, given to the district court to amend the plan in any way which seems wise to leave the Reading Company properly financed to meet its obligations to the public.

"It does not seem necessary to change the general form of that feature of the plan by which through the distribution of certificates of interest to the stockholders of the old Reading Company in the stock of the new coal company, the stock relations of the old Reading Company and the present coal company are to be ended, though we would not limit the power of the district court in this regard. The adopted plan was nicely adjusted to secure a practical working basis for both companies, and we would not embarrass the district court, after a full hearing of all the parties in the detailed changes which it may find practically necessary to adopt in following the general outlines of our modification of the plan.

"We think it not unreasonable to accept the suggestion made at the bar, namely, that not only shall the stockholders of the coal company upon receiving and registering their stock be required to make affidavits that they have no stock ownership in the Reading Company and are not acting for, or representing, any one who has, but also that the merged Reading Company shall be required to adopt a by-law effective till the further order of the court permitting registration of transfers of shares of its capital stock in the names only of persons who shall make affidavit that they are not stockholders, registered or actual, in either the new or the old coal company, and have not been and are not holders of proxies to vote shares of stock therein.

"As to the New Jersey Railroad Company and the Wilkes-Barre Coal Company, we have heard no criticism and the provisions as to them are approved. By the decree the new coal company, its officers and directors are enjoined from voting the coal company stock so as to form a combination between the coal company and the Reading Company. The Reading Company and all persons acting for or in its interest are perpetually enjoined from acquiring, receiving, holding, voting or in any manner acting as the owner of any shares of the new coal company, and the new coal company and all persons acting for it are enjoined from acquiring, or voting, any of the shares of the Reading Co.

"The coal company shall be permanently enjoined from issuing to the Reading Company, and the Reading Company from receiving, any stock, bonds, or other evidences of corporate indebtedness of the coal company. On default the trustee of the mortgage is required to vote the coal company stock so as not to bring about a recurrence of the conditions condemned in this cause, and if it shall be necessary to sell the properties they are to be sold to different interests. The attorney general and his successors in office are given by the decree full opportunity to keep watch upon the relations between the two companies and to appeal to the court for prompt enforcement of the injunctions of the decree as they may be advised. The court retains large control of the decree, with power to assure its continued efficacy by the summary remedy of contempt. With these restrictive provisions and the modifications of the plan outlined above, we think that the independence of the four companies will be fully achieved.

"The decree of the district court is affirmed with modifications already indicated and the case is remanded for further proceedings in conformity to this opinion."

Foreign Railway News

Locomotive Exports in March

Fourteen steam locomotives were exported from this country in March, valued at $112,243. Seven of these, valued at $49,716, went to Canada; one ($5,350) to Guatemala; one ($12,377) to Cuba; one ($20,000) to Chile; three ($21,100) to China; and one ($3,700) to British South Africa. These figures were compiled by the Bureau of Foreign and Domestic Commerce.

Concession for 2,400 Miles of Railway in Peru

Press dispatches from Lima, Peru, carry the information that a concession has been granted to a financial syndicate calling for the construction of 2,400 miles of railway. The syndicate also receives a grant of 25,000,000 acres of land with valuable mineral and petroleum rights and a 33-year monopoly on the nation's tobacco business.

Another British Equipment Combine

LONDON.

An amalgamation of great interest is that of the Vacuum Brake Company in France, Belgium, Spain and Portugal, with Tyer & Company, manufacturers of signal equipment, in the same countries. The new firm will be known as the Société Anonyme des Appareils de Securité de Chemins de Fer. As is well known the vacuum brake is largely used on British freight trains, a fact which may influence the adoption of this form of brake for continental railways, inasmuch as when freight cars are exchanged either by train, ferry or the proposed Channel tunnel it will be the British cars that will have to be used, since they can travel without alteration on continental railways, whereas the continental freight cars are too large for English clearances.

Rate Reductions in Britain

A number of important rate reductions have been made by British railways. These include:

1. Restoration of pre-war demurrage regulations.
2. Reduction of increase over pre-war rates from 100 per cent to 75 per cent on coal, coke, iron and steel and raw materials used in making iron and steel, and reduction in flat rate on coal from 6d. per ton to 4d.
3. Varying reductions in fuel handling charges at railway docks and ports.
4. Warehouse charges reduced and free time increased.
5. Shippers' tickets issued for £600 of business instead of £1,000.
6. Unsold exhibits of machinery at agricultural shows returned to owner at one-half regular rates.
7. Lower rates on milk.
8. Lower rates for passenger train parcel service.

Electric Traction on Norwegian Railways

The work of electrifying the line of the Norwegian State Railways from Lulea to the northern Norwegian border at Riksgränsen is proceeding again after being suspended by war-time conditions. The total length of the line from Lulea to Riksgränsen is 263 miles, and there is a continuation of the line across the northern part of Sweden, a distance of 24 miles, to Narvik, an Atlantic port.

The original electrified section was 80 miles long and extended from Kiruna to Riksgränsen. This was described briefly in the July 11, 1919, issue of the *Railway Age*, page 61.

The electrified section was extended southward from Kiruna to Nattavara, a distance of about 90 miles. This work was completed in October, 1921. By the first of this year the electrified section had been extended to Boden, about 74 miles farther south, and it is expected that the remaining distance to Lulea will be under electric operation by the first of July this year.

The part of the line which extends across the northern part of Norway, known as the Ofot Railway, is also being electrified and it is expected that this work will be completed by the first of October, 1922. The greater part of the entire line is north of the Arctic Circle.

The Drammen line from Christiania to Drammen, Norway, a distance of 32 miles, has just been converted and put under electric operation early in May of this year.

Car Exports in March

But one passenger car, valued at $4,000, was exported in March. It went to Mexico. Freight car exports, however, totaled 149, valued at $136,665, as follows: 19 to Canada ($17,884); 59 to Mexico ($8,706); 17 to Cuba ($14,680); one to Argentina ($1,500); 30 to Peru ($18,900); and 25 to Portuguese East Africa ($74,995). These figures were compiled by the Bureau of Foreign and Domestic Commerce.

March Exports of Car Wheels and Axles

Exports of car wheels and axles in March weighed 4,019,524 lb. and were valued at $116,802, according to the compilation of the Bureau of Foreign and Domestic Commerce. Detailed figures follow:

Countries	Pounds	Countries	Pounds
Belgium	227,000	Jamaica	32,183
France	226,700	Cuba	190,837
England	8,925	Brazil	6,300
Canada	477,405	Chile	22,500
Costa Rica	48,055	Colombia	2,500
Guatemala	73,620	Ecuador	15,171
Honduras	5,528	British Guiana	10,483
Mexico	1,073,132	Japan	1,421,509
Peru	6,706	Australia	27,172
Venezuela	2,958	British South Africa	3,585
British India	13,300	Other countries	1,752
Chosen	120,070		
New Zealand	2,133	Total	4,019,524
		Value	$116,802

$8,000,000 Placed in Contracts for French Electrification

A quantity of equipment for electrifying 125 miles of main line, including 80 freight locomotives and 80 passenger motor cars, is to be furnished to the Paris-Orleans Railway by a group of French manufacturers headed by the Compagnie Française Thomson-Houston. The Paris-Orleans Railway is one of the six large systems of France which operate something more than 5,000 miles of route. The Compagnie Francaise Thomson-Houston is the representative of the International General Electric Company. The 1,500-volt direct current system will be used and, according to dispatches received recently, this installation is the beginning of a more extensive program. The greater part of the equipment will be manufactured in France, but it is understood that considerable material of American manufacture will also be required.

The locomotives will be used on an extension of the original electrification, made about 25 years ago by the French Thomson-Houston Company. The first section of the new 1,500-volt section will cover 125 miles of main line between Paris and Vierzon. The motor cars will replace and extend the present suburban steam service out of Paris.

According to plans, high speed, through passenger service from Paris to Vierzon will be handled by 1,500-volt, direct current electric locomotives weighing 125 tons each and capable of regular running speeds of between 80 and 85 miles an hour. These locomotives are not included in the contracts thus far awarded, but the railway company is expected to announce the placing of this business at an early date and to give consideration soon to the purchase of additional locomotives for use in the Central Plateau Region.

Earnings of Chinese Railways

From the standpoint of earnings Chinese railroads do not suffer by comparison with the best American roads, according to the Wall Street Journal. In 1918, the last year for which accurate figures are available, average earnings a mile of all Chinese government railroads was: Gross, $22,700; operating expenses, $10,400; net operating revenue, $12,300; deductions, $2,890; net income, $9,410.

The Peking-Mukden line showed a net income per mile of $23,107 for 1918. These extraordinary earnings were made by roads which are practically without branches, feeders or connections. Each Chinese road originates its own traffic. When

branch lines and links between existing lines shall have been built it is reasonable to suppose that an astonishing increase will show in earnings.

According to Merle R. Walker, who made an extensive study of Chinese railroad conditions and prospects, Chinese railroads operate for less than any other in the world. The average operating ratio for all government roads in 1918 was 44.2 per cent. The Peking-Hankow road (with average miles operated of 815) showed as low as 33.5 per cent, while the Peking-Mukden (with average miles operated of 605) showed an operating ratio of 33.1 per cent.

This discrepancy in the amount of gross revenue consumed may be accounted for by the enormous saving of labor costs. A Chinese section hand is paid approximately $100 a year.

Chinese roads are used intensively. Although they are greatly under-equipped and the cars and locomotives are much smaller than those in use on American roads, nevertheless freight and passenger densities are astonishing. Average capacity for all freight cars is 22 tons, comparing with 42.2 tons in the United States. The average tractive effort of Chinese freight locomotives is 22,300 pounds, against 64,500 pounds on American roads.

In 1916 the Canton-Sanshui line had a passenger density of 1,447,030. The Shanghai-Nanking line showed over 1,272,000 in 1918. The passenger density for all railroads in China in 1918 was nearly 424,000. Average freight density for all Chinese government railroads is 616,126.

A great many miles of road have been projected and an era of rail construction is not far off. China is theoretically committed to government ownership of railroads. This has been probably the chief factor in the great cost of these roads. But so widespread is the need for transportation that no matter how costly the road or poor the judgment shown in its location, it is bound to pay. Total mileage does not exceed 7,000 and a network of 275,000 would be inadequate to serve the needs of the country.

British Railways Announce Great Extensions in Tourist and Excursion Services

Last year from various causes, summer excursion and tourist services were not introduced in Great Britain until late in July. This year, for the first time since 1914, holiday train service is inaugurated at the beginning of June on a liberal scale and will gradually be augmented until July when the full summer service will be in operation. The railways will provide, in addition to the ordinary train services, all descriptions of excursion trains and will give cheap fare facilities so numerous as to suit not only large numbers of people, but individuals and small pleasure parties as well.

It is the hope of the railways that with the special facilities for traveling which will be provided, those members of the public who are able to do so will find it to their advantage to take their holidays in the month of June or early in July, when the days are long and accommodation at pleasure resorts can be more readily obtained than in August during the school holidays.

On the first day of June the earlier holiday movement began with the introduction of tourist tickets, the issue of which will be continued until the end of October. This form of ticket provides for breaking the journey en route and resuming the tour at any time during the two months for which the ticket is available. Tours in the most picturesque parts of the country have been arranged and there will be a wide choice to suit every taste. Tickets will be issued at a single fare and two-thirds.

Throughout the season frequent day and half-day excursions at about a single fare for the double journey will be provided by special trains to many favorite resorts. It is also the intention of the railways to run excursion trains to any town where a local event of sufficient importance is being held. Long period excursions for a week or a fortnight at about a single fare and a third for the round trip are being arranged, and will in certain cases commence on Friday, June 9.

Long distance excursions have been arranged to run over two or more railway systems, and it will be possible to travel from towns in England to pleasure resorts in Scotland and Ireland; the north of England to the Midlands, Wales, the Southern and Western counties and in the reverse direction. There will be a restoration of the popular cross country excursions, and excursions from and to large industrial centres.

Guaranteed day, half-day and long period excursion trains, a popular feature of railway travel before the war, will again be revived. Under this system the Railway companies will provide a special train by arrangement with organizers who will guarantee not less than 300 adult excursion fares. In pre-war days these excursions were frequently organized on behalf of societies, schools, factories and even whole towns on holiday bent. Where the fare is not less than ten shillings a guarantee of 200 adult fares will be accepted.

Amongst the novelties in cheap fare facilities will be the issue of return tickets at a reduced rate by specified regular trains to individual passengers traveling on early closing days from towns to holiday resorts within a radius of 60 miles. Cheap tickets by specified regular trains will also be issued in connection with important local events. Attractive day and half-day bookings will be given enabling passengers to take combined rail, road, river and sea trips, rail and river tours, and many other pleasure excursions. Certain companies will also issue combined hotel and travel tickets. Other arrangements embrace the collection, conveyance in advance, and delivery of passengers' luggage at a small inclusive charge.

Pleasure parties, members of clubs and associations (minimum number 12 adult tickets) will be able to take day trips at a reduced charge of about a single fare and a third for the double journey by any regular train by prior arrangement with the railway involved. The popular Saturday to Monday tickets will continue to be issued between any two stations by regular train at about a single fare and a third for the double journey. Minimum fare 5 shillings third class and ten shillings first class. Improved facilities will be provided in connection with the regular train services, i. e., express trains will be duplicated or strengthened as required, additional through cars run between distant points, and other improvements introduced.

Exports of Track Materials in March

In March 26,066 tons of rails were exported, valued at $1,431,004. Other track material exports were: 2,995,042 lb. of rail joints, splice bars, fish plates and tie plates ($104,084); 525,223 lb. of switches, frogs and crossings ($40,808); 1,437,263 lb. of spikes ($40,808); and 602,476 lb. of bolts, nuts, washers and lock nuts ($28,571). These figures were compiled by the Bureau of Foreign and Domestic Commerce and are in detail:

Countries	Rails, Tons	Rail Joints, Bars, Fish and Tie Plates, Pounds	Splice Plate. Plates,	Frogs Switches, and Crossings, Founds	Railroad Spikes, Pounds	Railroad Nuts, Bolts, Washers and Nut Locks, Pounds
Denmark	.....	.....		14,907	.....	.....
Spain	36	.....		26,736	.....	.....
Switzerland	.....	.....		50,695	.....	.....
England	702	8,500		1,495	.....	5,812
Canada	587	75,662		133,883	110,100	41,589
Costa Rica	104	19,331		.....	20,000	10,000
Guatemala	.....	.....		.....	10,000	.....
Honduras	.....	.....		28,030	48,800	30,202
Panama	.....	3,834		.....	200	5,100
Mexico	322	67,261		80,412	207,575	14,899
Other British W. Indies	.....	862		5,412	2,000	.....
Cuba	1,910	374,757		44,392	237,000	80,835
Dominican Republic	.....	.....		.....	15,000	5,079
Brazil	33	51,000		7,425	41,266	106,912
Chile	93	43,466		.....	4,196	2,830
Colombia	1,137	178,005		674	99,274	15,283
Ecuador	33	3,450		7,973	30,900	12,144
Peru	.....	.....		3,499	35,000	24,830
Venezuela	35	.....		.....	1,000	1,627
China	139	8,062		1,625	13,031	10,066
Chosen	565	64,960		.....	42,560	6,720
Hongkong	23	.....		.....	426	.....
Japan	14,001	1,061,080		108,500	290,923	119,803
Kwantung, leased territory	6,290	1,032,940		.....	224,000	102,350
Philippine Islands	50	2,651		.....	.....	.....
Other countries	6	221		9,565	4,438	6,395
Total quantity	26,066	2,995,042		525,223	1,437,263	602,476
Total valuation	$1,431,004	$104,084		$40,806	$40,806	$28,571

State Co-operation Proposed for Spanish Railways

LONDON.

In consequence of the difficulty experienced by the Spanish railways in maintaining a service adequate to the public requirements the state has declared itself willing to co-operate in the manner laid down in a Project of Law of April 4, 1922, which has been presented to the Cortes.

According to the proposed law, which was published in the "Gaceta de Madrid" of April 5, 1922, the operation of the railways shall be regulated as follows from the date of its promulgation:

The state shall organize at its own expense any work of development or improvement, and shall acquire any material which may be considered necessary in order to adapt to public requirements the railways of public service at present in existence, even though they may be the object of concessions, if the improvements, etc., have not already been put in hand by the concessionaires. The joint undertaking (the result of the co-operation) shall be managed by the concessionary companies, but in accordance with standards set by the Railway Board (a newly-formed body). These standards, while safeguarding the interests of the state, shall leave as free as may be possible the management of the railway companies.

The Railway Board, among other powers, may propose redistribution of the lines, either by means of transferring the working or administration, or by redeeming the concessions, or other means, the rights of the concessionary companies being always considered. They may propose the buying up of the remainder of a concession, and may supervise the technical, economic, and financial management of the companies and their respective railways. (A delegation shall be formed for this purpose, which shall attend meetings of shareholders, etc., and can apply for the intervention of the Board if anything illegal or detrimental is noticed in the management).

The Board shall also approve of the railway tariffs, taking into consideration certain expenses. The rates may last for a period not exceeding six years.

As regards profits, the costs of operation and pensions shall be deducted from the gross receipts, and the remainder shall be divided between the companies (in proportion to the actual and present value of the business, the working of which belongs to them during the period concerned) and the state (in proportion to the actual and present value of the share of capital contributed by it). In both cases the Board will fix the value, taking as basis the effective capital invested by the concessionary company. The actual value to the concessionary shall in no case exceed capitalization at 5 per cent of the average net proceeds during the previous fifteen years. The company are to have ½ per cent of the remainder above-mentioned for their services in managing the joint undertaking, this claim being given priority.

In certain cases, however, when the actual value of the business, the working of which belongs to the concessionary, exceeds the nominal capital of the mortgage bonds guaranteed by the business and issued before the establishment of the joint undertaking, the first expenses to be deducted from the remainder of proceeds each year shall be the interest and the money for amortisement of the said bonds. In this case the concessionary shall have the right of preference not exceeding 3 per cent of the difference between the actual value of its participation in the business and the nominal value of the bonds in circulation when the joint undertaking came into being. An account shall be opened, called the "Redeemed Bonds Account," to be divided between the concessionary and the State, the latter's share being repayable by the concessionary to the state.

The concessionary shall be subject to the provisions of this law, including those relating to the redemption of the concession or the consolidation of national ownership of the railways, and if the concession was conceded in perpetuity, the working of the same shall be reduced to 99 years, counting from the date on which the state assistance began.

The consolidation of national ownership may anticipate the expiry of the respective concessions, and shall include everything used in connection with the railways, their working or administration, but shall not include mining concessions or works belonging to the concessionary companies, although the produce is consumed by the railways.

The amount to be paid annually to the concessionary when the concession is redeemed before expiry shall be fixed by the Consejo de Ministros on the proposals of the Railway Board, taking into consideration the proceeds of the working in the past and the estimates for the future, not counting the portion brought by the state.

Equipment and Supplies

Locomotives

THE ERIE is having 5, 2-10-2 type locomotives repaired at the shops of the Baldwin Locomotive Works.

THE NASHVILLE, CHATTANOOGA & ST. LOUIS is inquiring for 5 Mountain type and 5 Mikado type locomotives.

JOHN MARSCH, INC., Chicago, has ordered four 6-wheel switching engines from the Baldwin Locomotive Works.

THE AKRON, CANTON & YOUNGSTOWN has ordered 2 Consolidation type locomotives from the Baldwin Locomotive Works, Philadelphia.

THE BROWNELL IMPROVEMENT COMPANY, Chicago, has ordered two 4-wheel locomotives from the American Locomotive Company.

THE PACIFIC STATE LUMBER COMPANY, Tacoma, Wash., has ordered 1 Mikado type locomotive from the Baldwin Locomotive Works.

THE ARGENTINE STATE RAILWAYS have ordered 8 Mountain type locomotives and 1 Pacific type locomotive from the Baldwin Locomotive Works.

Freight Cars

THE BUFFALO & SUSQUEHANNA is inquiring for 100 gondola car bodies.

THE PITTSBURGH CRUCIBLE STEEL COMPANY is inquiring for 15 flat cars of 100 tons' capacity.

THE CHICAGO GREAT WESTERN is inquiring for repairs to 245 box cars of 40 tons' capacity.

THE UNION REFRIGERATOR TRANSIT COMPANY, Milwaukee, Wis., is inquiring for 150 steel underframes for 40-ton refrigerator cars.

THE PERE MARQUETTE, reported in the *Railway Age* of May 13 as inquiring for 500 box cars, has ordered this equipment from the Pressed Steel Car Company.

KANSAS CITY SOUTHERN.—The notice in the *Railway Age* of May 29 that this road was inquiring for 1,000 40-ton box cars was premature. The road is not in the market for these cars at the present time.

THE BALTIMORE & OHIO has ordered 1,000, 70-ton low-side gondola cars from the Cambria Steel Company, and will have repairs made to 1,000 gondola cars and 1,000 hopper cars at the shops of the Pressed Steel Car Company; also to 1,000 coke cars at the shops of the Standard Steel Car Company.

THE SEABOARD AIR LINE, reported in the *Railway Age* of May 27 as inquiring for 900 steel underframe ventilated box cars of 40 tons' capacity, and for 100 phosphate cars of 50 tons' capacity, has ordered the box cars from the Pressed Steel Car Company and the phosphate cars from the Magor Car Corporation.

THE CHESAPEAKE & OHIO has arranged for the purchase of 300, 40-ton box cars in addition to the 1,400 already ordered as noted in the *Railway Age* of April 29. The company expects, also, to place orders early in June for the 500 ventilated box cars mentioned in the *Railway Age* of May 13. Specifications are now being made for 50 refrigerator cars.

Passenger Cars

THE NEW YORK, CHICAGO & ST. LOUIS, reported in the *Railway Age* of April 22 as inquiring for 5 coaches and 2 steel baggage cars, has ordered 7 cars from the Pullman Company.

Iron and Steel

THE PENNSYLVANIA is inquiring for 300 tons of plates, bars and sheets.

THE ST. LOUIS-SAN FRANCISCO is inquiring for 300 tons of structural steel.

THE WABASH is inquiring for 1,000 tons of draft arm plates and channel plates.

THE ILLINOIS CENTRAL has ordered 123 tons of steel from the Kenwood Bridge Company for signal bridges.

Machinery and Tools

THE SOUTHERN PACIFIC has ordered a 200-ton overhead traveling crane from the Niles-Bement-Pond Company.

THE DELAWARE & HUDSON has ordered a 42-in. center drive car wheel lathe from the Niles-Bement-Pond Company.

THE CAMBRIA & INDIANA has ordered a 79-in. driving wheel lathe and a thirty six-inch planer from the Niles-Bement-Pond Company.

THE ILLINOIS CENTRAL is inquiring for 28 lathes of various types, four steam hammers and a power hammer, four carwheel borers, four grinders of various types, two sets of bending rolls, two vertical boring mills, two forcing presses, two drill presses, two forging machines, a slotter, a slab miller, a punch and shear, a crank shaper, a hack saw, a bolt threading machine and a heavy duty planer.

Track Specialties

THE BALTIMORE & OHIO is inquiring for 5,000 kegs of spikes.

THE TOLEDO, ST. LOUIS & WESTERN has ordered 13,000 Continuous joints from the Rail Joint Company.

THE AURORA, ELGIN & CHICAGO has placed an order with the Rail Joint Company for 6,400 Continuous joints.

THE HOCKING VALLEY has placed an order with the Rail Joint Company for 1,500 insulated and compromise 100 per cent rail joints.

Signaling

THE SOUTHERN PACIFIC has ordered from the General Railway Signal Company a Saxby & Farmer interlocking, 8 levers, for Houston, Texas.

The DELAWARE & HUDSON has ordered from the General Railway Signal Company an electric interlocking, 8 levers, for installation at Watervliet, N. Y.

The CHICAGO, ROCK ISLAND & PACIFIC has ordered from the General Railway Signal Company an electric interlocking, 20 levers, for installation at Des Moines, Iowa, together with 13 switch machines.

Miscellaneous

THE ARGENTINE STATE RAILWAYS are inquiring for 1 dynamometer car.

THE EVANSVILLE, INDIANAPOLIS & TERRE HAUTE will receive bids until June 12 for 15 bridge spans.

THE CLEVELAND, CINCINNATI, CHICAGO & ST. LOUIS, will receive bids until June 12 for 15 bridge spans and 1,500 barrels of Portland cement to be supplied for the period from June 1 to September 1.

THE NORFOLK & WESTERN will receive bids until 12 o'clock noon, June 7, at Roanoke, Va., for its requirements of steel springs from July 1, 1922, to December 31, 1922, also for 2,500 pounds of wire fence staples.

Supply Trade News

Walter R. Pflasterer has been appointed agent of the **Track Specialties Company,** New York. Mr. Pflasterer's office will be at 527 Manhattan building, Chicago.

The Mt. Vernon Car Manufacturing Company, Mt. Vernon, Ill., recently let a contract for the construction of a one-story foundry building to cost equipped $250,000.

The Dressel Railway Lamp & Signal Company, Arlington, N. J., has been incorporated with **A. D. Hobbie,** president and treasurer, **F. Hallett Lovell, Jr.,** vice-president, **F. W. Dressel,** vice-president, and **L. L. Pollak,** secretary. The new company succeeds the Dressel Manufacturing Corporation, formerly known as the Dressel Railway Lamp Works, New York City, originally established in 1882, with factory formerly located at 3860-80 Park avenue, New York City. All the officers of the new company have for a long time been identified with the railroad lighting and signal field. Increased facilities and equipment have been acquired at the new plant located at Arlington. The company recently developed and made improvements in electric headlights, switch and signal lamps and intends to bring out in addition a number of new devices.

A. D. Hobbie

A. D. Hobbie is also vice-president and general manager of F. H. Lovell & Co., Arlington, and he has been active in the railroad field for over 20 years. F. Hallett Lovell, Jr., is president and treasurer of F. H. Lovell & Co., and was president of the Klaxon Company until it was taken over by the General Motors Company. F. W. Dressel has a long record as a lighting expert in signal and maintenance of way departments and was for a number of years president of the Dressel Lamp Works. L. L. Pollak has been for a number of years, production manager of F. H. Lovell & Co.

F. W. Dressel

The Mississippi Valley Structural Steel Company has been formed by a merger of the Decatur Bridge Company, Decatur, Ill., and the Christopher & Simpson Iron Works Company, St. Louis, Mo.

W. B. Murray, for the past 12 years chief engineer of the **Miller Train Control Corporation,** Danville, Ill., has been elected a vice-president, which position he will assume in addition to his present duties as chief engineer.

The National Bronze & Aluminum Foundry Co., Cleveland, Ohio, is building an addition of 150 ft. to its new plant at

East Eighty-eighth street and Laisy avenue, and is in the market for a few molding machines and some miscellaneous foundry equipment.

M. G. Snow, formerly assistant engineer in the valuation department of the New York Central, Cleveland, Ohio, has resigned to become cost engineer of the **Froehlick & Emery Engineering Company,** Toledo. This company is at present appraising all interurban railways operating in Michigan for the public utilities commission.

Philip L. Maury has been elected a vice-president of the **Detroit Graphite Company** with headquarters at Detroit, Mich. He will have direct charge of all activities of the company pertaining to its paint and varnish business with railroads. Mr. Maury was born in Denver, Colo., on October 5, 1884. After leaving school he entered the paint business and has been connected with that industry ever since, having served for many years with the Sherwin-Williams Company as manager of railway and industrial sales, which position he leaves to take up his new duties with the Detroit Graphite Company. During the war he was in charge of the government activities of the Sherwin-Williams Company and was closely identified with the work of the War Service Committee of the Paint Manufacturers' Association.

P. L. Maury

J. M. Duncan, whose selection as general sales manager of the **Detroit Steel Casting Company,** with headquarters at Detroit, Mich., was announced in the *Railway Age* of May 20 (page 1196), was born at Toronto, Canada, on February 22, 1888. Mr. Duncan has entered the railway supply field on November 27, 1905, in the employ of the Detroit Steel Casting Company. He was later made "follow-up engineer" of this company in which position he personally followed every important shipment to its destination to see how the castings were applied, and to ascertain whether more satisfactory results could be obtained by closer co-operation between the management and the user. He was serving in this capacity at the time of his recent promotion.

J. M. Duncan

A. R. Ludlow, vice-president in charge of sales of the **Air Reduction Company, Incorporated,** New York, has been elected first vice-president; **M. W. Randall,** secretary, has been elected vice-president and secretary; **Herman Van Fleet,** chief engineer, has been elected vice-president and operating manager and **Dr. F. J. Metzger** has been elected vice-president in charge of research and development.

The Railroad Buyers' and Sellers' Service Bureau has been organized with **W. H. Hassett,** general manager and **J. L. Newman,** editor in chief, with headquarters in the Railway Exchange building, Chicago. Its service will include a condensed weekly review of market conditions, a department of scientific research, a personal emergency service for clients who require immediate information, and a telephone directory and buyers guide of Chicago and adjacent territory.

John F. Schurch, vice-president of the T. H. Symington Company, with office at St. Paul, Minn., has left that company and has been elected a vice-president of **Manning, Maxwell & Moore, Inc.,** New York. He will be in charge of sales in the middle west and west, with headquarters at Chicago, 27-29 North Jefferson street. Mr. Schurch was graduated from the University of Minnesota in 1893. He entered the service of the Minneapolis, St. Paul & Sault Ste. Marie the same year, serving consecutively in the office of the auditor and of the general superintendent and in the transportation department, resigning in 1905 after having attained the position of chief clerk to the vice-president. From 1905 until 1914 he was associated with the Railway Materials Company of Chicago. In February, 1914, he was elected vice-president of the Damascus Brake Beam Company with office in Cleveland, Ohio, and in June, 1914, he was elected president of the same company, which position he resigned the same year and was elected vice-president in executive charge under President T. H. Symington, of the Symington Company. Mr. Schurch is president of the Railway Supply Manufacturers' Association, which has in charge the exhibits at Atlantic City in connection with the meetings this month of Division V—Mechanical, and Division VI—Purchases and Stores, A. R. A.

J. F. Schurch

At a meeting of the board of directors of the **Joliet Railway Supply Company** held in Chicago this week, **Burton Mudge** and **Fred A. Poor** were elected directors. Burton Mudge was elected president to succeed Frederick L. Sivyer, who remains as a director. Messrs. Mudge and Poor have acquired a controlling interest in this company, but Mr. Sivyer and his associates and the Northwestern Malleable Iron Company will continue to hold a substantial interest in the company and will be represented on its board. Mr. Mudge states that this is a preliminary step in the reorganization of the business and in the enlargement of the personnel and facilities of the company to handle properly its growing business. He adds that there will be no change in the direct management of the business, James H. Slawson, first vice-president, continuing as heretofore in charge of manufacturing and all other departments, and Charles A. Carscadin, vice-president in charge of sales. The company owns and operates a steel fabricating plant in Chicago where it manufactures car truck bolsters and brake beams. Its general offices are in the Railway Exchange, Chicago.

Changes in Baldwin Personnel

Several changes in the official personnel of the **Baldwin Locomotive Works** were made recently; **J. P. Sykes,** vice-president in charge of manufacture, has been appointed senior vice-president in charge of plant and manufacture; **C. A. Bourgeois,** works manager, has been appointed vice-president in charge of manufacture; **J. L. Vauclain,** in the plant and equipment department, has been appointed vice-president in charge of plant and equipment. **Harry Glaenzer,** chief mechanical engineer, has been appointed vice-president in charge of engineering to succeed Kenneth Rushton, deceased, and **W. A. Russell,** purchasing agent, has been appointed vice-president in charge of purchases.

Railway Construction

ATCHISON, TOPEKA & SANTA FE.—This company has authorized the construction of a new boiler and tank shop at Albuquerque, N. M., to cost approximately $400,000; also the construction of boiler washing plants at Amarillo, Texas and Winoka.

ATCHISON, TOPEKA & SANTA FE.—This company is receiving bids for station extensions and alterations at Lobbock, Texas, and Waynoka, Okla., to cost approximately $15,000 at each place and has awarded a contract to Jerome Moss, Chicago, for the construction of bunk houses at Ottawa, Kans., Cherryville and Strong City, Kansas, and at Newkirk, Oklahoma, to cost approximately $37,000.

CHICAGO, BURLINGTON & QUINCY.—This company will soon close bids for the construction of a passenger station at Mitchell, Neb., and for station extensions at Thermopolis, Wyo. The company has awarded a contract to A. J. Armbruster & Company, Aurora, Ill., for the construction of a passenger station at Aurora to cost approximately $100,000.

ERIE.—This company expects in the near future to call for bids for an extension to its shops at Hornell, N. Y.

ILLINOIS CENTRAL.—This company has awarded a contract to W. J. Zitterall, Webster City, Iowa, for the construction of a brick station at Ziegler, Ill.

PACIFIC FRUIT EXPRESS.—This company is accepting bids for the construction of artificial ice plants at Nampa, Idaho, and Pocatello, each of which will involve the expenditure of approximately $50,000.

PENNSYLVANIA.—This company is asking for bids on raising tracks and change of line near Phoenix, Md. Approximate quantities include about 135,000 cu. yd. excavation, 1,300 cu. yd. of masonry, two miles of track material unloaded, distributed and laid, 20,000 cu. yd. cinder fill removed, 10,000 lin. ft. track removed, 4,600 lin. ft. raised, 5,000 cu. yd. ballast unloaded and surfaced, etc. This company is also asking for bids for work necessary to complete the engine terminal facilities at Hagerstown, Md., on the Cumberland Valley division. Approximate amount of materials includes about 13,500 cu. yd. excavation, 2,000 cu. yd. concrete masonry, 32,000 cu. yd. cinders unloaded, 7,000 cu. yd. cinder ballast, 2.5 miles track material unloaded and laid, 28 turnouts in place, etc. Bids will be received up to June 7. J. W. Craig, assistant engineer, Baltimore, Md., will be in charge of the former, and W. K. Martin, engineer of construction, Harrisburg, Pa., of the latter work.

PERE MARQUETTE.—This company has resumed the construction of its Flint Belt line, started last year, and expects to complete the work this season, the total cost of which will approximate $650,000.

ST. PAUL UNION STATION.—This company will close bids on June 14 for approximately $5,000,000 of construction work on the new Union station at St. Paul, Minn., this work to involve the completing of the third and fourth periods of the project, for each of which separate bids are being called. The work will involve extensions to the waiting rooms, track elevation and street subways.

WESTERN MARYLAND.—This company has awarded a contract to the M. A. Long Company, Baltimore, for the erection of a 100 ft. by 300 ft. Mallet locomotive repair shop at Port Covington, Baltimore. The shop will be fully equipped with cranes and other machinery.

WICHITA FALLS & OKLAHOMA.—The Interstate Commerce Commission has issued a certificate authorizing the construction of an extension from Byers, Texas, to a point on the Texas-Oklahoma state line, 5.8 miles, and authorizing the Wichita Falls & Oklahoma of Oklahoma to construct a line from a connection with that extension to Waurika, Okla., 7½ miles.

Railway Financial News

CAROLINA & GEORGIA.—*Authorized to Issue Bonds.*—This company has been authorized by the Interstate Commerce Commission to issue $350,000 of first mortgage 6 per cent gold bonds, $135,000 to be exchanged for outstanding bonds and the remainder to be sold at 85, the proceeds to be used in constructing and equipping the road.

CENTRAL OF NEW JERSEY.—*Authorized to Issue Equipment Bonds.*—The Interstate Commerce Commission has authorized an issue of $2,000,000 of 6 per cent equipment bonds in connection with the procurement of 25 locomotives, 50 passenger coaches, 10 combination cars and 10 baggage and express cars.

CENTRAL PACIFIC.—*Southern Pacific Must End Control.*—See article on another page entitled "Separation of Southern Pacific and Central Pacific Ordered."

CHICAGO & NORTH WESTERN.—*Asks Authority to Sell Bonds.*—This company has applied to the Interstate Commerce Commission for authority to sell $1,815,000 general mortgage gold bonds of 1987 now held in the treasury and to issue and sell $418,000 of similar bonds to reimburse the treasury for expenditures.

CHICAGO UNION STATION.—*Bond Sale.*—Kuhn, Loeb & Co., Lee, Higginson & Co., The National City Company and the First National Bank, of New York, and the Illinois Trust & Savings Bank of Chicago have purchased, subject to the approval of the Interstate Commerce Commission, $6,150,000, face value, Chicago Union Station Company first mortgage 5 per cent gold bonds, series B, due July 1, 1963. The bonds have been placed privately.

CLEVELAND, CINCINNATI, CHICAGO & ST. LOUIS.—*Authorized to Assume Liability.*—The Interstate Commerce Commission has authorized this company to guarantee principal and interest of $2,118,000 of first mortgage 4½ per cent bonds of the Evansville, Mt. Carmel & Northern which are to be used for acquiring certain securities issued by the Peoria & Eastern.

CLEVELAND, CINCINNATI, CHICAGO & ST. LOUIS.—*Application to Acquire Stock of Peoria & Eastern Dismissed.*—The Interstate Commerce Commission has dismissed the application of this company to purchase additional capital stock of the Peoria & Eastern, of which it already owns a majority, and its outstanding bonds in the amount of $4,000,000. The report says the purchase of the remaining stock will not give the applicant any other or further control than that which it acquired prior to the enactment of the new law and that the application is not within the scope of Paragraph 2 of Section 5 of the Interstate Commerce Act.

COLUMBUS & GREENVILLE.—*Authorized to Abandon Line.*—The Interstate Commerce Commission has issued a certificate authorizing the abondonment as to interstate and foreign commerce of two branch lines from Stoneville, to Percy, Miss., 23.26 miles, and from Itta Bena to Webb, Mo., 34.38 miles.

ILLINOIS CENTRAL.—*Authorized to Issue Preferred Stock.*—The Interstate Commerce Commission has authorized the issue of $10,929,600 of preferred stock to be sold at not less than par for cash and the proceeds to be used for construction purposes in connection with the electrification and enlargement of its Chicago terminals.

INTERNATIONAL & GREAT NORTHERN.—*Reorganization Plan Announced.*—The reorganization plan of the International & Great Northern, in receivership since August, 1914, has been announced by J. & W. Seligman & Co. and Speyer & Co. The plan has been accepted by the committee of holders of the company's three-year 5 per cent notes of which Frederick Strauss is chairman.

The plan gives the new company a capitalization of $44,150,000. The fixed charges will be $1,179,000 as compared with the present company's fixed charges of $1,597,175, a reduction of $418,175. The contingent interest charges on the new company's adjustment mortgage bonds will be $1,020,000.

Under the plan there will be authorized $40,000,000 first mortgage bonds, $25,000,000 adjustment mortgage bonds, interest on which will be cumulative after January 1, 1928, and, $7,500,000 common stock.

For the present there will be issued $20,000,000 of the first mortgage bonds in Series A at 6 per cent and maturing July 1, 1952. Of this amount

$2,750,000 will be used to secure a note of $2,400,000 to the director-general of railroads. The amount of adjustment mortgage bonds to be issued will be $17,000,000, Series A, paying 6 per cent and with a 30-year maturity.

Speyer & Co. and J. & W. Seligman are forming a syndicate to underwrite the cash requirements of the plan which are estimated at approximately $18,000,000. The plan provides a working fund of approximately $4,000,000 for the new company. The deposit of bonds by the various classes of holders is asked under the plan, the limit of time for such being set at July 1.

Under the terms of the plan the stock of the new company is to be assigned to Willard V. King, James Speyer and Frederick Strauss as trustees to be held by them jointly subject to a trust agreement for a five-year period.

Holders of the various classes of International & Great Northern securities who agree to the terms of the reorganization and deposit their holdings will, on completion of the reorganization, be entitled to the following:

For each $1,000 International & Great Northern first mortgage gold bond with coupon maturing November 1, 1922 (amount outstanding $11,290,500), $1,000 first mortgage 6 per cent bonds, Series A, of the new company, carrying interest from July 1, 1922, and $55 in cash.

For each $1,000 Colorado Bridge Company first mortgage gold bond with coupon maturing November 1, 1922 (amount outstanding $130,000), $1,000 first mortgage 6 per cent bonds, Series A, of the new company, carrying interest from July 1, 1922, and $57.50 in cash.

For each $1,000 International & Great Northern Railroad Company three-year gold note with coupon maturing August 1, 1914 (amount outstanding $11,000,000), $1,222.92 adjustment mortgage 6 per cent bonds, ranking for interest from January 1, 1923, and $222.92 in common stock.

For each $1,000 International & Great Northern Railroad Company first and refunding mortgage bonds with coupons maturing May 1, 1914, and all subsequent coupons (amount outstanding $1,108,000), $978.34 adjustment mortgage bonds ranking for interest from January 1, 1923, and $467.50 in common stock.

Provision is made in the plan to pay off in cash at maturity November 1, 1922, holders of first mortgage bonds of the International & Great Northern Railroad Company and the Colorado Bridge Company who do not elect to deposit their securities under the plan.

MISSOURI, KANSAS & TEXAS.—*Annual Report.*—The annual report issued this week shows the following income account for the year ended December 31, 1921:

	1921	1920
Operating revenues	$63,020,975	$72,914,737
Operating expenses	50,055,784	69,880,879
Taxes, etc.	2,624,764	2,106,352
Operating income	10,340,427	927,506
Other income	4,525,705	761,013
Gross income	14,866,132	1,688,519
Interest, rents, etc.	8,964,783	8,989,895
Net income	5,901,349	Def.7,301,376

NEW YORK, NEW HAVEN & HARTFORD.—*Equipment Notes Offered.*—Edward B. Smith & Co., Halsey, Stuart & Co., and Edward Lowber Stokes & Co., of New York, are offering $2,561,000 6 per cent equipment gold notes at prices to yield from 5.00 per cent to 5.70 per cent according to maturity. The notes are dated January 15, 1920, due $197,000 per annum, January 15, 1923, to January 15, 1935, both inclusive. They are part of an authorized issue amounting to $4,438,500.

NORFOLK & WESTERN.—*Equipment Trust Certificates Authorized.*—The Interstate Commerce Commission has authorized this company to assume obligation and liability in respect of $6,700,000 of equipment trust certificates to be issued by the Commercial Trust Company of Philadelphia, to be sold so as to net not less than 97¾ per cent.

NORTHERN PACIFIC.—*Annual Report.*—This company's annual report for 1921 is reveiwed in an article on another page of this issue entitled "Northern Pacific Ton-Mileage Cut 33 Per Cent." See also excerpts from annual report on adjacent pages.

PHILADELPHIA & READING.—*Six Months' Guaranty Certified.*—The Interstate Commerce Commission has issued a final certificate stating the amount necessary to make good this company's guarantee for the six months of 1920 at $9,509,080, of which $1,656,060 was still to be paid.

PORTLAND TERMINAL COMPANY.—*Authorized to Issue Bonds.*—The Interstate Commerce Commission has authorized an issue of $195,000 of first mortgage 5 per cent bonds to be guaranteed by the Maine Central and to be pledged with the director general of railroads in connection with the funding of indebtedness to the United States.

SOUTHERN PACIFIC.—*Control of Central Pacific Ended.*—See article on another page entitled "Separation of Southern Pacific and Central Pacific Ordered."

WICHITA FALLS & SOUTHERN.—*Authorized to Issue Securities.*—This company has been authorized by the Interstate Commerce Commission to issue $161,000 of common stock, $644,000 of non-cumulative preferred stock to be sold at not less than 80, and $688,000 of first mortgage, 6 per cent gold bonds to be sold at not less than 85. The common stock is to be issued in part payment of advances for capital purposes and the proceeds of the preferred stock and bonds for construction and equipment and to discharge certain indebtedness.

More Equipment Trusts Sold

The director general has announced additional sales at par plus accrued interest, of railroad equipment trust certificates maturing January 15, 1923, to January 15, 1935, inclusive, held by the government, to:

Potter & Company, New York City, and Cassatt & Company, Philadelphia, Pa. Toledo, St. Louis & Western Railroad Company, approximately two-thirds of each annual maturity from January, 1923, to January, 1935, inclusive	$682,500
Commercial Trust Co., Philadelphia, Pa. Minneapolis & St. Louis Railroad Company, two-thirds of each annual maturity from January, 1923, to January, 1935, inclusive	873,600
Edward Lowber Stokes & Co., Philadelphia, Pa., Halsey, Stuart & Co., New York City, and Edward B. Smith & Co., Philadelphia, Pa. The New York, New Haven & Hartford Railroad Company, approximately two-thirds of each annual maturity from January, 1923, to January, 1935, inclusive	2,561,000
Alfred Borden, New York City, and The Chase National Bank of New York, New York City, Chicago, Rock Island & Pacific Railway Company, approximately one-third of each annual maturity from January, 1923, to January, 1935, inclusive, being the portion heretofore subordinated under the plan mentioned above	2,344,550
Chesapeake & Ohio Railway Company, one-third of each annual maturity from January, 1923, to January, 1935, inclusive, being the portion heretofore subordinated under the plan mentioned above	3,283,800
Alfred Borden, New York City. Chicago Junction Railway Company, approximately one-third of each annual maturity from January, 1923, to January, 1935, inclusive, being the portion heretofore subordinated under the plan mentioned above	137,800
	$9,883,250

The total amount of equipment trust certificates sold by the government to date, at par plus accrued interest, reaches the total of $263,258,750.

Tentative Valuations

The Interstate Commerce Commission has issued tentative valuation reports, in which it states the final value as follows:

		Property owned	Property used
Bonlee & Western	1916	$7,300	.....
Augusta & Summerville	1916	71,121	$79,671
Washington Western	1917	164,410	.....

Dividends Declared

Beech Creek.—$50, quarterly, payable July 1 to holders of record June 15.

Boston & Albany.—$2.50, quarterly, payable June 30 to holders of record May 31.

Buffalo & Susquehanna.—Common, 1¾ per cent, quarterly; preferred, 2 per cent, semi-annually; both payable June 30 to holders of record June 15.

Cleveland, Cincinnati, Chicago & St. Louis.—2 per cent, payable June 15 to holders of record June 2.

New York & Harlem.—Common and preferred, $2.50, semi-annually, payable July 1 to holders of record June 15.

Pittsburgh, McKeesport & Youngstown.—$1.50, semi-annually, payable July 1 to holders of record June 15.

Reading Company.—2d preferred, 1 per cent, payable July 13 to holders of record June 25.

Trend of Railway Stock and Bonds Prices

	May 29	Last Week	Last Year
Average price of 20 representative railway stocks	67.22	66.64	55.41
Average price of 20 representative railway bonds	86.28	86.65	73.86

W. J. HARAHAN, president of the Chesapeake & Ohio, officiated in the office of the Richmond Dispatch on the evening of May 25 as broadcaster, to send out a radio message calling attention to the Careful Crossing Campaign which is being conducted by the American Railway Association.

RADIO EXPERIMENTS made on a passenger train of the St. Louis-San Francisco between Oklahoma City and Lawton, a distance of about 100 miles on May 31 were very successful, music and other communications being received in a satisfactory fashion throughout the trip.

Annual Report

Twenty-Fifth Annual Report of the Northern Pacific Railway Company

Office of the
NORTHERN PACIFIC RAILWAY COMPANY,
St. Paul, Minnesota.

April 5, 1922.

To the Stockholders of the
Northern Pacific Railway Company:

The following, being the twenty-fifth annual report, shows the result of the operation of your property for the year ending December 31, 1921.

INCOME ACCOUNT.

	1920	1921	Increase—I Decrease—D	
Avcrage mileage operated.	6,653.36	6,658.03	I	4.67
OPERATING INCOME				
Operating revenues	$113,084,407.78	$94,538,059.44	D	$18,546,348.34
Operating expenses	100,983,874.19	77,630,867.23	D	23,353,006.96
Net operating revenue.	12,100,533.59	16,907,192.21	I	4,806,658.62
Railway tax accruals	10,108,686.38	9,014,120.50	D	1,094,565.88
Uncollectible railway revenues	18,468.90	17,895.63	D	573.27
Railway operating income	1,973,378.31	7,875,176.08	I	5,901,797.77
Equipment rents—net	4,696,161.69	1,445,605.83	D	3,250,555.86
Joint facility rent—net	1,279,918.22	1,523,044.26	I	243,126.04
Net railway operating income	7,949,458.22	10,843,826.17	I	2,894,367.95
NONOPERATING INCOME				
Income from lease of road	289,703.28	319,651.44	I	29,948.16
Miscellaneous rent income	674,576.12	698,165.20	I	23,589.08
Miscellaneous nonoperating physical property	49,250.60	104,544.58	I	55,293.98
Separately operated properties—profit	31,067.31	94,816.69	I	63,749.38
Dividend income	4,353,552.00	21,858,646.00	I	17,505,094.00
Income from funded securities	926,686.48	2,346,638.70	I	1,419,952.22
Income from unfunded securities and accounts	937,803.20	806,462.67	D	131,340.53
Income from sinking and other reserve funds	.....	47.92	I	47.92
Miscellaneous income	2,574.27	323,709.52	I	321,135.25
Total nonoperating income	7,265,213.26	26,552,682.72	I	19,287,469.46
Gross income	15,214,671.48	37,396,508.89	I	22,181,837.41
DEDUCTIONS FROM GROSS INCOME				
Rent for leased roads	51,322.02	51,320.65	D	1.37
Miscellaneous rents	9,643.07	10,328.04	I	684.97
Interest on funded debt	12,134,437.60	14,480,679.83	I	2,346,242.23
Interest on unfunded debt	14,060.08	10,631.28	D	3,428.80
Amortization of discount on funded debt	.....	304,273.42	I	304,273.42
Miscellaneous income charges	231,895.32	473,876.50	I	241,981.18
Total deductions from gross income	12,441,358.09	15,331,109.72	I	2,889,751.63
Net income	2,773,313.39	22,065,399.17	I	19,292,085.78
Compensation under contract with United States Government	5,301,309.04	.....	D	5,301,309.04
Guaranty under Transportation Act of 1920	14,760,606.14	.....	D	14,760,606.14
	22,835,228.57	22,065,399.17	D	769,829.40
Deduct, Federal income, January and February, 1920, included above	3,741,045.26	.....	D	3,741,045.26
Net corporate income	19,094,183.31	22,065,399.17	I	2,971,215.86
Dividend appropriations of income	17,360,000.00	17,360,000.00		.....
Income balance for the year, transferred to profit and loss	$1,734,183.31	$4,705,399.17	I	$2,971,215.86

REVENUE TRAIN MILEAGE

Revenue passenger train miles during the year were 9,925,632, a decrease of 52,328 miles compared with the previous year.

Revenue freight and mixed train miles during the year were 8,893,013, a decrease of 3,011,442 miles.

Revenue special train miles during the year were 11,525, a decrease of 1,295 miles.

All revenue train miles during the year were 18,830,170, a decrease of 3,065,065 train miles.

EARNINGS.

FREIGHT BUSINESS.

Freight revenue was $69,246,505.06, a decrease of $11,843,884.57, or 14.61 per cent compared with the previous year.

5,289,784,354 tons of revenue freight were moved one mile, a decrease of 2,563,063,399 tons one mile, or 32.64 per cent compared with the previous year.

The average earnings per ton mile increased from .01033 to .01309.

The revenue train load decreased from 659.66 to 594.82 tons. The total train load, including company freight, decreased from 761.21 tons to 700.49.

The number of miles run by revenue freight trains was 8,202,829, a decrease of 3,006,338, or 26.82 per cent.

PASSENGER BUSINESS.

Passenger revenue was $17,015,155.15, a decrease of $4,128,552.79 or 19.53 per cent compared with the previous year.

Mail revenue was $1,699,835.15, a decrease of $1,191,234.25 or 41.20 per cent; making allowance for back mail pay received, there was an increase of $273,640.82, or 24.19 per cent.

Express revenue was $2,081,541.60, a decrease of $244,535.30, or 10.51 per cent.

Sleeping car, parlor and chair car, excess baggage and miscellaneous passenger revenue was $881,763.72, an increase of $80,236.50, or 10.01 per cent.

Total revenue from persons and property carried on passenger and special trains was $21,678,295.62, a decrease of $5,484,085.84, or 20.19 per cent compared with the previous year.

The number of passengers was 6,178,296, a decrease of 2,269,670 over the previous year, and the number of passengers carried one mile was 505,701,937, a decrease of 213,744,024, or 29.71 per cent.

The number of miles run by revenue passenger trains was 9,925,632, a decrease of 52,328, or .52 per cent.

The average rate per passenger mile was 3.365 cents against 2.939 cents last year.

EARNINGS AND EXPENSES PER MILE OPERATED.

	1917	1918	1919	1920	1921
Operating revenues per mile	$13,526.37	$15,594.28	$15,282.27	$16,996.59	$14,199.10
Operating expenses per mile	8,171.39	10,857.13	11,934.71	15,177.88	11,659.73
Net operating revenue per mile	5,354.98	4,737.15	3,347.56	1,818.71	2,539.37
Taxes per mile	1,059.52	1,236.01	1,365.42	1,519.34	1,353.87
Net	$4,295.46	$3,501.14	$1,982.14	$299.37	$1,185.50

RATIOS.

	1917	1918	1919	1920	1921
Operating expenses to operating revenue	60.41%	69.62%	78.10%	89.30%	82.12%
Taxes to operating revenue	7.83%	7.93%	8.93%	8.94%	9.53%

CONDUCTING TRANSPORTATION.

The charges for transportation expenses were $35,797,966.62, a decrease of $12,641,034.66, or 26.10 per cent, as against a decrease in total operating revenue of 16.40 per cent.

MAINTENANCE OF EQUIPMENT.

The charges for maintenance of equipment were $21,825,817.02, a decrease of $3,768,106.32, or 14.72 per cent.

LOCOMOTIVES.

Total number of locomotives on active list December 31, 1920, the date of the last annual report		1,446
Additions:		
Locomotives purchased	10	
Locomotives remodeled	2	
Locomotives acquired	1	
		13
		1,459
Deductions:		
Locomotives sold during year, from active list	1	
Locomotives dismantled and withdrawn from service	21	
		22
Total locomotives on active list December 31, 1921		1,437
In addition to the locomotives on active list there were:		
Withdrawn from service and on hand December 31, 1920	36	
Withdrawn from service during the year	21	
		57
Less—Rebuilt and reinstated on active list		2
Leaving on hand locomotives withdrawn from service which may be sold		55

HAULING CAPACITY

	Number	Tractive power (Pounds)	Total weight on drivers (Pounds)	Total weight of locomotives (Pounds)
Assignment December 31, 1920.	1,446	52,136,870	233,398,783	298,555,918
Added during year, locomotives purchased and remodeled	13	836,900	3,819,100	4,278,500
*Added during year		16,900	178,350	174,350
Total	1,459	52,990,670	237,396,433	303,008,768
Locomotives sold and withdrawn from service	22	417,800	1,279,487	2,356,862
Total	1,437	52,572,870	236,116,946	300,651,906

*Account compound locomotives changed to simple, locomotives having superheaters applied, changes in steam pressure, etc.

Condition	Dec. 31, 1920 Number	Dec. 31, 1920 Per cent	Dec. 31, 1921 Number	Dec. 31, 1921 Per cent
Good	1,172	81.05	1,182	82.26
Fair	101	6.98	76	5.29
At shops and waiting shop	156	10.79	164	11.41
Unserviceable, waiting disposition	17	1.18	15	1.04
	1,446	100.00	1,437	100.00
Number of oil burning locomotives	10	.69	9	.63
Number of locomotives equipped with superheaters	600	41.49	630	43.84

PASSENGER EQUIPMENT

On December 31, 1921, the Company owned 1,154 passenger train cars, an increase of 113 cars, consisting of 135 express refrigerator cars transferred from freight equipment less 22 other passenger cars transferred to other classes of equipment during the year.

Of the 1,154 cars owned, 774 were not due in shops for two months or more.

During 1921, 62 passenger train cars had steel underframes, steel platforms and steel sheathing applied; 107 cars are being remodelled in 1922. By July 1, 1922, all passenger train cars in transcontinental trains will have been strengthened and remodelled. The purchase of 70 passenger train refrigerator cars has been authorized and these cars will be delivered in 1922.

Freight Equipment

The purchase of freight train cars has been authorized as follows and cars will be received during 1922:

Box	1,000
Refrigerator	1,000
Coal	250
Stock	250
Hart Convertible	250
Total	2,750

Bad Order Car Situation on December 31st.

	1920	1921	Increase—I Decrease—D	
Owned cars on line	29,323	38,319	I	8,996
Total cars on line (N.P. and foreign)	47,165	47,166	I	1
Number of cars unserviceable	3,856	3,960	I	104
Percentage of unserviceable to total cars on line	8.18	8.40	I	.22
Number of cars requiring heavy repairs	2,087	3,170	I	363
Percentage of total cars on line	5.95	6.72	I	.77
Number ot cars requiring light repairs	1,049	790	D	259
Percentage of total cars on line	2.23	1.68	D	.55

MAINTENANCE OF WAY AND STRUCTURES

The charges for maintenance of way and structures were $14,312,916.45, a decrease of $6,699,881.73 or 31.88 per cent.

The following statements give particulars of some of the work done.

Permanent Way

	Year 1920	Year 1921
Main line relaid with 90 pound rail ...miles	151.09	25.09
Main line relaid with 85 pound rail ...miles	3.09	.62
Branch lines relaid with 90 pound rail...miles	4.79	9.00
Branch lines relaid with 56, 66, 72 and 85 pound rail,miles	38.97	33.35
Second track relaid with 85 pound rail...miles	.67	.....
Second track relaid with 90 pound rail...miles	27.34	19.96
New second track laid with 90 pound rail ...miles	.27	2.90
Sidings and spurs constructed ...miles	10.81	21.55
Track ballasted ...miles	227.50	182.98
Track ballasted ...cubic yards	372,260	356,743
Track ballasted (patch or repairs)...cubic yards	144,906	121,602
Embankments widened ...miles	107.60	72.66
Cross, bridge and switch tie renewals, main line...ties	1,395,094	1,072,530
Cross, bridge and switch tie renewals, branch lines...ties	973,303	734,065
Timber bridges replaced by permanent structures and embankments	28	53
Equal to ...miles	1.11	1.13
Timber bridges renewed	134	115
Timber culverts renewed	24	37
Timber culverts replaced in permanent form	173	140
New stock fences constructed ...miles	80.27	46.32
New snow fences constructed ...miles	.14	.....

BRIDGES

During the year 173 bridges were replaced, of which 115, 11,539 feet in length, were replaced by timber structures, and 5 permanent and 53 timber structures were replaced in permanent form as follows:

Replaced by embankment	29 bridges, 3,676 lineal feet
Replaced by steel viaduct, plate girders, I-beams and reinforced concrete trestles	29 bridges, 3,511 lineal feet
Total	58 bridges, 7,187 lineal feet

In addition to changes referred to above, one temporary and one permanent bridge were abandoned, 37 temporary and 2 permanent structures were added; 177 culverts were rebuilt, 37 in temporary form and 140 in permanent form.

There are now under construction 535 lineal feet of steel girder and I-beam spans for single track, 54 lineal feet for double track, 32 lineal feet for three tracks, 145 lineal feet of steel truss for single track, and 32 lineal feet of reinforced concrete trestle for double track.

Buildings at Stations

New buildings and structures or increased facilities have been provided at the following stations:

Minnesota: Bald Eagle, Hinckley, Cloquet, Brainerd.
North Dakota: Jamestown, Sentinel Butte, Dickinson, Beach.
Montana: Laurel, Logan, Trout Creek.
Washington: Ellensburg, Spokane, Olympia.

Block Signals and Interlockings

An eight lever section was added to interlocking plant at Sauk Centre, Minnesota.

No additional automatic lock signals were installed.

Water Supply

Additional or increased facilities have been provided at the following points:

Minnesota: Brainerd.
Washington: Cooper, Lester, Yakima, Sumas.

GENERAL

Financial Results of Operation

1921 was a very poor year for the railroads, particularly in the country between Lake Superior and Puget Sound.

The volume of passenger business was 26.87 per cent and of freight business 24.64 per cent less than in 1920. The freight business was the smallest since 1912, except for the year 1915, when the amount was practically the same. In consequence the operating revenues of the Company decreased $18,546,348.34, or 16.4 per cent. Expenses were taken hold of vigorously and were reduced $23,353,006.96, or 23.13 per cent. Net operating revenue increased $4,806,658.62, or 39.72 per cent.

Claims for Balance Due from Government

As stated in the last annual report there was received from the Director General $9,0C0,000 on account, in settlement of the contract with the Government for the period of Federal Control ended February 29, 1920. Since then there has been received $1,599,914.03 in final settlement.

The claim of the Company for payment for the Guaranty Period of six months ended August 31, 1920, is before the Interstate Commerce Commission; $12,000,000 has been received on account and it is expected a final adjustment will be made in the year 1922.

Valuation Work

The Bureau of Valuation continued the work of valuing the property and late in 1921 filed its preliminary engineering report. Your officers are of the opinion that some of the quantities and unit prices used in this report are inadequate. A statement of objections has been filed with the Bureau and it is hoped that some increases will be obtained before the Interstate Commerce Commission serves its tentative valuation.

The preliminary land and accounting reports have not yet been filed by the Bureau of Valuation, but it is expected that they will be received some time during the summer or fall of 1922.

The number of company employes engaged in this work at the present time is ninety-six, and the total expenditure for the Company's proportion of the work up to December 31, 1921, was $1,698,091.97.

Land Department

The operations of the Land Department for the year 1921 are shown in the report. The depression in business, and particularly in agriculture in the territory served by your lines, was even more pronounced and its effect upon the business of the Land Department more widespread than last year. It was necessary to continue the policy of cancellation of contracts and although a considerable area of land was sold, the acreage included in cancelled contracts exceeded the acreage in new sales by 76,293.56 acres. Attention is directed to the fact, however, that the payments made under these cancelled contracts are retained and the lands may be resold. Although it is unfortunate that conditions have required the termination of such a large number of contracts in the last few years, it may be possible that in the long run the present apparent monetary loss may be overcome to a certain extent, at least, by resale at higher valuations. The deficit in the net proceeds is caused by these heavy cancellations. Payments of principal and interest under outstanding land contracts are again much less than in the previous year. The money has not been available for contract holders to make the necessary payments under their contracts.

Oil Development

During 1921 there was marked progress in oil exploration in Montana. New wells to the number of 190 were commenced and at the end of the year drilling was in progress on 27 wells; 97 wells were idle; 73 wells in three fields were producing oil; 3 wells were being used as water wells; 80 wells had been abandoned. The Cat Creek field continued to be a large producer. During the year 1,317,143 barrels were produced and shipped from 68 wells, making a total since the first shipment in August, 1920, of 1,547,261 barrels. In the Devil's Basin field there are two producing wells, but,, lacking pipe line connection, the oil has been used for fuel in the field. In February, 1921, the Soap Creek oil field, in southern Bighorn County, was discovered; subsequently three wells have been brought in. The oil is chiefly valuable for fuel and appears in considerable quantity. Driling is actively in progress in both the Devil's Basin and Soap Creek fields, as well as in a number of other localities in Central and Eastern Montana. So far the production of oil from any lands owned or controlled by your company has been very small. The Company, however, owns a large acreage in districts, the geology of which indicates oil possibilities.

The Absaroka Oil Development Company, which was organized last year under the control of your company, was active throughout the year. A large territory was covered and reported upon by its geological parties, and although in its first season's operations no oil has been found, a large amount of valuable information has been obtained which will be of assistance in the future. Arrangements were effected with a number of other companies for drilling test wells in various localities and that work is now in progress.

Refunding of Northern Pacific-Great Northern, C. B. and Q. Collateral, Joint 4% Bonds

As indicated in the last annual report, the joint 4% bonds issued in 1901 were retired on July 1, 1921, by proceeds of issue of joint collateral bonds of the Northern Pacific and Great Northern Railway Companies to the amount of $230,000,000, payable in 15 years, bearing interest at 6½% per annum and convertible to the extent of $115,000,000 each, into Great Northern General Mortgage 7% Gold bonds, Series A, due July 1, 1936, or Northern Pacific Railway Company Refunding and Improvement 6% Mortgage bonds, Series B, due July 1, 2047, and redeemable as a whole at the option of the Northern Pacific Railway Company on or after July 1, 1936, at 110% and accrued interest.

The Great Northern proportion of $115,000,000 of these bonds was converted into its 7% General Mortgage bonds. Of the Northern Pacific proportion of these bonds only $9,950,400 was converted as of December 31, 1921, leaving a balance of $105,049,600 which will doubtless be converted in due time. Steps are now being taken to convert all the outstanding 6½% bonds and it is thought the conversion will be completed within a few months.

Through the issue of these bonds, the Company owns 830,102 shares of Chicago, Burlington and Quincy Railroad Company stock, and the dividends received pay the interest on the bonds.

Freight Rates and Passenger Fares

Increased rates and fares authorized by the Interstate Commerce Commission August 26, 1920, were in effect at the beginning of the year, except as to certain intrastate rates in North Dakota and Montana, but numerous reductions have been made during the year. Some reductions were proposed by the carriers to meet commercial conditions, and some were made by order of the Interstate Commerce Commission as in the case of rates on agricultural products and livestock. The general level of rates for 1922 is, therefore, below that in effect for 1921.

Comparative Statement of Payrolls

During the year there has been a reduction in payrolls due to some reductions in wages authorized by the United States Labor Board and decrease in the number of employes and smaller amount of work done.

Comparison for a period of years follows:

Total payroll for year ending June 30, 1915	$24,486,852.00
Total payroll for year ending December 31, 1916	28,204,669.00
Total payroll for year ending December 31, 1917	35,877,879.00
Total payroll for year ending December 31, 1918	49,632,127.00
Total payroll for year ending December 31, 1919	52,605,396.00
Total payroll for year ending December 31, 1920	66,503,794.00
Total payroll for year ending December 31, 1921	50,643,526.00

Security Owners and Employes

There are now about 37,000 owners of stock and 30,000 owners of bonds of the Company. The average number of employes in 1921 was 28,911 and on March 15, 1922, 27,475.

Taxes

The tax question is serious for all forms of business and bears heavily upon the railroads. The following statement shows the increase since 1917:

State	1917	1918	1919	1920	1921
taxes	$5,169,742.57	$5,865,666.69	$6,913,707.44	$8,453,990.33	$8,339,049.60
Federal taxes	1,727,242.85	2,264,762.40	2,055,483.31	1,620,591.91	638,983.26
Canadian and miscellaneous taxes	13,742.77	26,654.17	31,546.72	34,104.14	36,087.64
Totals	$6,910,728.19	$8,157,083.26	$9,000,737.47	$10,108,686.38	$9,014,120.50

CHANGES IN DEBT

During the year the Company paid off $9,183,000 of debt, including $6,000,000 6% note due the Government. This results in an annual saving in interest of $501,540. There is an increase of $8,657,500 in the bonds in hands of the public issued to represent the Chicago, Burlington and Quincy stock owned; the dividends from that stock pay the interest on these bonds.

By order of the Board of Directors,

HOWARD ELLIOTT, Chairman. CHARLES DONNELLY, President.

GENERAL BALANCE SHEET, DECEMBER 31, 1921

ASSETS

	1920	1921	Increase or Decrease
Investments:			
Road and equipment.			
Road	$435,819,316.31	$437,779,244.79	$1,959,928.48
Equipment	87,215,926.09	88,471,598.69	1,255,672.60
General	2,883,388.83	3,192,835.78	309,446.95
	525,918,631.23	529,443,679.26	3,525,048.03
Sinking Funds	3,019.94	4,808.54	1,788.60
Deposits in Lieu of Mortgaged Property (Net moneys in hands of Trustees from sale of land grant land etc.	594,150.83	430,704.77	—163,446.06
Miscellaneous Physical Property	7,485,182.20	7,639,109.57	153,927.37
Investments in Affiliated Companies:			
Stocks	144,045,402.60	144,035,477.01	—9,925.59
Bonds	37,065,697.75	31,065,697.75	—6,000,000.00
Notes	2,556,599.35	8,489,399.35	5,932,800.00
Advances	2,976,081.13	3,148,469.99	172,388.86
	186,643,780.83	186,739,044.10	95,263.27
Other Investments:			
Stocks	1.00	1.00	.....
Bonds	9,773,668.30	9,529,180.11	—244,488.19
U. S. Treasury certificates of indebtedness	3,305,000.00	4,133,893.28	828,893.28
U. S. Treasury notes	.....	510,000.00	510,000.00
Contracts for sale land grant lands	13,571,498.75	12,085,607.89	—1,485,890.86
	26,650,168.05	26,258,682.28	—391,485.77
Total Capital Assets	747,294,933.08	750,516,028.52	3,221,095.44
Current Assets:			
Cash	9,778,593.45	17,307,315.44	7,528,721.99
Time drafts and deposits.	.....	3,183.81	3,183.81
Special deposits	6,155,299.69	1,984,428.25	—4,170,871.44
Loans and bills receivable	57,079.03	1,073.19	—56,005.84
Traffic and car service balances receivable	2,333,853.25	1,640,122.97	—693,730.28
Net balances receivable from agents and conductors	1,022,744.94	970,309.29	—52,435.65
Miscellaneous accounts receivable	7,513,362.38	6,309,975.54	—1,203,386.84
Material and supplies	14,372,325.02	15,084,505.51	712,180.49
Interest, dividends and rents receivable	479,071.97	263,145.93	—215,926.04
Due from U. S. Government under Federal control contract	19,046,122.87	.....	—19,046,122.87
Other current assets	133,854.56	102,930.48	—30,924.08
Total Current Assets	60,892,307.16	43,666,990.41	—17,225,316.75
Deferred Assets:			
Working fund advances	66,350.09	41,123.38	—25,226.71
Other deferred assets	18,004.27	17,578.49	—425.78
	84,354.36	58,701.87	—25,652.49
Due from U. S. Government account various transactions	12,379,707.71	2,581.60	—12,377,126.11
U. S. Government—value of material and supplies turned over	9,998,851.11	.....	—9,998,851.11
	22,378,558.82	2,581.60	—22,375,977.22
Unadjusted Debits:			
Rents and insurance premiums paid in advance	41,238.99	37,699.99	—3,539.00
Balance of Guaranty due from Government	9,760,606.14	2,760,606.14	—7,000,000.00
Discount on funded debt.	.....	8,888,150.80	8,888,150.80
Other unadjusted debits	3,177,372.63	2,139,016.80	—1,038,355.83
	12,979,217.76	13,825,473.73	846,255.97
	$843,629,371.18	$808,069,776.13	—$35,559,595.05

LIABILITIES

	1920	1921	Increase or Decrease
Stock:			
Capital stock—common	$248,000,000.00	$248,000,000.00	.....
Governmental Grants:			
Grants in aid of construction	3,406.60	9,730.31	$6,323.71
Long Term Debt:			
Funded debt (see p. 20)	324,214,500.00	453,513,600.00	129,299,100.00
Less—held by or for the Company	9,149,500.00	138,974,100.00	129,824,600.00
	315,065,000.00	314,539,500.00	—525,500.00
Total Capital Liabilities	563,068,406.60	562,549,230.31	—519,176.29
Current Liabilities:			
Traffic and car service balances payable	1,254,255.54	807,164.97	—447,090.57
Audited vouchers and wages payable	11,512,467.55	6,717,589.59	—4,794,877.96
Miscellaneous accounts payable	841,200.38	523,208.91	—317,991.47
Interest matured unpaid.	1,830,860.44	2,043,550.50	212,690.06
Unmatured dividends declared	4,340,000.00	4,340,000.00	.....
Unmatured interest accrued	528,073.61	477,067.85	—51,005.76
Unmatured rents accrued	6,147.20	6,147.05	—.15
Other current liabilities	395,542.92	131,537.75	—264,005.17
Total Current Liabilities	20,708,547.64	15,046,266.62	—5,662,281.02
Deferred Liabilities:			
Other deferred liabilities.	136,524.87	61,932.07	—74,592.80
Due U. S. Government account various transactions	11,109,411.05	138,975.88	—10,970,435.17
Due U. S. Government account expenditures for additions and betterments	17,412,603.48	.....	—17,412,603.48
Due U. S. Government for value of material and supplies turned back	10,650,577.61	.....	—10,650,577.61
	39,309,117.01	200,907.95	—39,108,209.06
Unadjusted Credits:			
Tax liability	6,527,116.63	6,447,337.39	—79,779.24
Operating reserves	1,771,257.68	342,030.33	—1,429,227.35
Accrued depreciation of equipment	35,473,839.97	39,034,608.99	3,560,769.02
Other unadjusted credits.	2,967,385.33	1,318,874.73	—1,648,510.60
	46,739,599.61	47,142,851.44	403,251.83
Corporate Surplus:			
Additions to property through income and surplus	128,184.59	217,801.65	89,617.06
Funded debt retired through income and surplus	15,214,356.79	15,467,623.04	253,266.25
Miscellaneous fund reserves	206,362.77	330,152.43	123,789.66
	15,548,904.15	16,015,577.12	466,672.97
Profit and loss balance	158,254,796.17	167,114,942.69	8,860,146.52
Total Corporate Surplus	173,803,700.32	183,130,519.81	$9,326,819.49
	$843,629,371.18	$808,069,776.13	—$35,559,595.05

PROFIT AND LOSS ACCOUNT

DECEMBER 31, 1921.

To		By	
Loss on retired road and equipment	$227,678.90	Balance December 31, 1920	$158,254,796.17
Surplus applied to sinking and other reserve funds	377,055.91	Balance of income for year ended December 31, 1921, see page 5	4,705,399.17
Surplus appropriated for investment in physical property	89,617.06	Profit on road and equipment sold	56,166.70
Net deficit of Land Department—year 1921	811,608.47	Unrefundable overcharges	1,631.06
Cost of property acquired over amount at which capitalized	6,359.11	Donations for installing spur tracks and sidings	89,617.06
Expenditures heretofore made on projects abandoned	16,949.01	Debt discount extinguished through surplus	1,297.65
Unextinguished discount on funded debt issued and reacquired	854,561.09	Settlement of claims vs. U. S. Government	6,262,770.87
Balance of sundry accounts	22,533.68	Discount on mortgage bonds purchased and canceled	86,110.73
Balance December 31, 1921	167,114,942.69	Unclaimed wages 3 years old	6,656.47
		Unpresented checks, drafts and vouchers written off	22,844.53
		Profit and salvage on miscellaneous property, etc.	26,442.54
		Unpresented mileage and baggage coupons written off	7,572.97
	$169,521,305.92		$169,521,305.92

[ADVERTISEMENT]

Railway Officers

Executive

G. W. Webster, whose promotion to vice-president of the Minneapolis, St. Paul & Sault Ste. Marie, with headquarters at Minneapolis, Minn., effective May 15, was reported in the *Railway Age* of May 20, page 1204, was born in Oshkosh, Wis., on December 1, 1870, and entered railway service on September 1, 1886, as a clerk on the Milwaukee, Lake Shore & Western. He was employed in various clerical capacities on this road until September 27, 1893, when he became secretary to the receiver of the Wisconsin Central. Thereafter he was consecutively the secretary to the receiver and chief clerk to the president from July 1, 1899, to October, 1906, and secretary of the corporation from that time to September 21, 1909, when he was also elected secretary of the Minneapolis, St. Paul & Sault Ste. Marie, the latter road having acquired control of the Wisconsin Central by lease a few months earlier. Thereafter he continued as secretary of these properties until March 1, 1920, when he was promoted to assistant to the president and elected secretary of the corporation controlling the Minneapolis, St. Paul & Sault Ste. Marie, the Duluth, South Shore & Atlantic and subsidiary companies, which position he occupied until his recent election to vice-president.

G. W. Webster

Franklin G. Robbins, director of the Bureau of Service of the Interstate Commerce Commission, has been elected vice-president of the Chicago & Erie. Mr. Robbins was born at La Crosse, Wis., on February 15, 1876. He attended the public schools at Minneapolis, Minn., and the Shattuck School at Fairbault, Minn. He began railroad work in 1888 with the Minneapolis, St. Paul & Sault Ste. Marie, working during school vacations as a messenger and later as a rodman and operator. After leaving school in 1896 he entered the employ of Kenneth Hopkins & Company on the Chicago Board of Trade and in 1906 entered the service of the Chicago, Burlington & Quincy as special car agent. He then served consecutively as traveling yardmaster, assistant trainmaster, trainmaster, assistant superintendent and superintendent for the same company, and in 1913 became superintendent of the Elmira, Corning & Waverly (an Erie subsidiary). In 1916 he was appointed general superintendent of the Erie at Chicago. In 1917 he resigned this position to enter the army as a major. Later he was promoted to lieutenant-colonel. In 1920 he was appointed director of the Bureau of Service of the Interstate Commerce Commission, in which position he was serving at the time of his election to the vice-presidency of the Chicago & Erie.

F. G. Robbins

W. E. Brown has been elected president of the Cowlitz, Chehalis & Cascade with headquarters at Chehalis, Washington, succeeding **C. L. Brown,** who has been elected vice-president.

Robert S. Parsons, general manager of the Erie with headquarters at New York, has been elected vice-president in charge of operation with the same headquarters. Mr. Parsons was born at Hohokus, N. J., and attended Rutgers College. He began railroad work in 1895 as a rodman for the Erie and the following year was promoted to assistant engineer. In 1899 he was appointed division engineer of the New York, Susquehanna & Western. He returned to the Erie in 1913 as engineer maintenance of way and three years later was promoted to assistant general superintendent. He was appointed superintendent of the Susquehanna division in 1907 and three years later was transferred to the New York division, in the same capacity. On January 1, 1913, he was appointed assistant general manager of the lines east of Buffalo and Salamanca with headquarters at New York. The following year he was appointed general manager of the Ohio grand division (the Erie's western lines) with headquarters at Cleveland, Ohio. In January, 1916, he was appointed chief engineer. The following year he became assistant to the president and chief engineer and in November, 1917, he was appointed assistant to the president and general manager. Under the Railroad Administration he served as chief engineer and, in 1920, became general manager.

R. S. Parsons

Financial, Legal and Accounting

Louis A. Bell, auditor of the New York, Chicago & St. Louis, has been elected comptroller with headquarters at Cleveland, Ohio, effective May 29.

W. T. Hughes, vice-president and associate publisher of the Courier-Journal, Louisville, Ky., has been elected to the newly created position of general attorney of the Chicago, Rock Island & Pacific, with headquarters at Chicago, effective June 1, to represent the road in federal matters.

G. J. Bunting, assistant director of the Division of Finance of the Interstate Commerce Commission, has been elected comptroller of the Illinois Central, with headquarters at Chicago, effective May 15, to succeed W. D. Beymer. **L. A. Harkness,** assistant to vice-president in charge of accounting, has been appointed general auditor.

Traffic

V. P. Summerfield has been appointed assistant general freight agent of the Pennsylvania, Eastern region, and **J. T. Carbine** has been appointed coal freight agent, both with headquarters at Philadelphia. **J. S. Murphy** has been appointed division passenger agent at Atlantic City, N. J. These appointments were effective June 1.

Richard B. Lend has been promoted to chief of the tariff bureau of the Chicago, St. Paul, Minneapolis & Omaha, with headquarters at St. Paul, Minn., to succeed H. A. Mintz, who has been promoted to assistant general freight agent, with headquarters at St. Paul, to succeed L. A. Mitzener, resigned. Effective the same date, Thomas J. Kenniff has been promoted to assistant general freight agent.

Operating

A. S. Brainard has been appointed second chief train dispatcher of the Southern Pacific with headquarters at San Francisco, succeeding J. T. Bell, assigned to other duties.

I. B. Sinclair, whose appointment as superintendent of the Delaware division of the Pennsylvania was announced in the *Railway Age* of April 22, page 998, was born at Bernard Castle, England, on April 2, 1879. He entered the employ of the Pennsylvania as a clerk in the office of the general superintendent of transportation at Philadelphia on April 18, 1898. He remained in that position until April 1, 1907, when he was transferred as a clerk to the office of the superintendent of freight transportation of the Eastern Pennsylvania division. On November 1, 1909, he became an assistant section foreman (a position in the car service department equivalent to that of assistant chief clerk) on the Eastern Pennsylvania division and on April 1, 1911, became a clerk in the same department. In May of the same year he was appointed timekeeper and, the following November, to assistant foreman again. On July 1, 1912, he went to the office of the general superintendent of transportation in the same capacity. On August 1 he was appointed a special agent in the same department and on June 1, 1913, was promoted to inspector. On June 7, 1915, he was transferred to the Maryland division in the same capacity and on December 18, was promoted to assistant trainmaster. He was promoted to freight trainmaster on February 1, 1918, and to assistant superintendent of the Philadelphia division on March 1, 1920. He was serving as assistant division superintendent on this division at the time of his recent promotion.

I. B. Sinclair

Mechanical

S. B. Riley has been appointed superintendent of motive power of the Western Maryland with headquarters at Hagerstown, Md., succeeding G. F. Wieseckel, resigned.

Engineering, Maintenance of Way and Signaling

E. L. Martin, engineer maintenance of way of the Missouri, Kansas & Texas, has resigned effective June 1, to become vice-president of the Hutt Contracting Company, Kansas City, Mo., in which he has purchased a substantial interest. Mr. Martin was educated at the Texas College of Agriculture and Mechanics Arts, immediately following his graduation from which in 1899 he entered railway service as an axman on the Texas & New Orleans. He remained in the service of the Southern Pacific in Texas and Louisiana consecutively as rodman, instrumentman and assistant engineer on various projects until 1902 when he entered the employ of the Kansas City Southern as assistant engineer, with headquarters at Pittsburg, Kan., a position he held until August, 1905, when he became division engineer on construction on the Gulf, Colorado & Santa Fe. He continued in the service of the latter road consecutively as division engineer and assistant construction engineer on the building of about 200 miles of line in Louisiana and Texas until 1912 when he resigned to handle the location and construction of 20 miles of line for an industry. Upon the completion of this work he re-entered railway service as district engineer on the Missouri, Kansas & Texas of Texas, a position he held until May, 1916, when he was placed in charge of the construction of the San Antonio, Tex., terminals of this company. Upon the completion of this project in 1917 he was promoted to engineer maintenance of way of the Texas Lines and held this position in Texas and later in Kansas until March 1, 1919, when he was made chief engineer, under the Railroad Administration, of the Missouri, Kansas & Texas, the Missouri, Kansas & Texas of Texas, the Missouri, Oklahoma & Gulf and the Wichita Falls & Northwestern. At the termination of federal control he was appointed assistant chief engineer in charge of maintenance of way of the Missouri, Kansas & Texas lines, the title of which position was later changed to engineer maintenance of way, which he carried until his resignation.

Obituary

J. E. McNeil, inspector of track and roadway of the Atchison Topeka & Sante Fe, Coast lines, died on May 28.

Harry C. Howe, freight claim agent of the Chicago & North Western with headquarters at Chicago and an employee of this company for more than 37 years, died May 24 at his home near that city at the age of 57.

Arthur F. Morris, for the past two years auditor of capital expenditures on the Chicago & North Western, with headquarters at Chicago, and an employee of that company continuously for 19 years, died May 22, at his home in Oak Park, Ill., after a three months' illness. Mr. Morris was born in Chicago in 1880 and was graduated in civil engineering from Princeton University in 1903, immediately following which he entered the service of the Chicago & North Western as a chainman. He served consecutively with that road as chainman, rodman, instrumentman and assistant engineer on location, construction, maintenance, track elevation and valuation until 1918, when he was appointed engineering auditor, in which capacity he served until 1920, when he was promoted to auditor of capital expenditures, the position he held at the time of his death.

Albert F. Rust, consulting engineer of the Kansas City Southern, with headquarters at Kansas City, Mo., whose death at his home in Kansas City, Mo., May 11, was reported in the *Railway Age* of May 27, page 1264, was born in Fultonville, N. Y., on April 29, 1849, and was educated at Ripon College, Ripon, Wis., from which he was graduated in 1871. He entered railway service in 1872 as an axeman on the Sheboygan & Fond du Lac (now a part of the Chicago & North Western), where he remained for a year, when he entered the employ of the New York Central as a rodman. Consecutively thereafter he was rodman and assistant engineer on the Midland Pacific from 1874 to 1876, assistant engineer on the Union Pacific from 1876 to 1885, and division engineer on the Missouri Pacific thereafter until 1887, when he left railway service to engage in private practice at Omaha, Neb. He re-entered railway service in 1889 as division engineer on the Missouri Pacific and was consecutively a division engineer on the Kansas City, Pittsburgh & Gulf (now Kansas City Southern) from 1893 to 1894, assistant engineer on the Missouri, Kansas & Texas from 1894 to 1895, resident engineer on the Kansas City, Pittsburgh & Gulf from 1895 to 1897, and engineer maintenance of way on the same road from 1897 to 1899. He entered the service of the Kansas City Southern in 1899, as chief engineer, in which capacity he served until 1911, when he became consulting and valuation engineer. He was relieved of the duties of valuation engineer in 1918, and thereafter continued as consulting engineer until the time of his death.

A. F. Rust